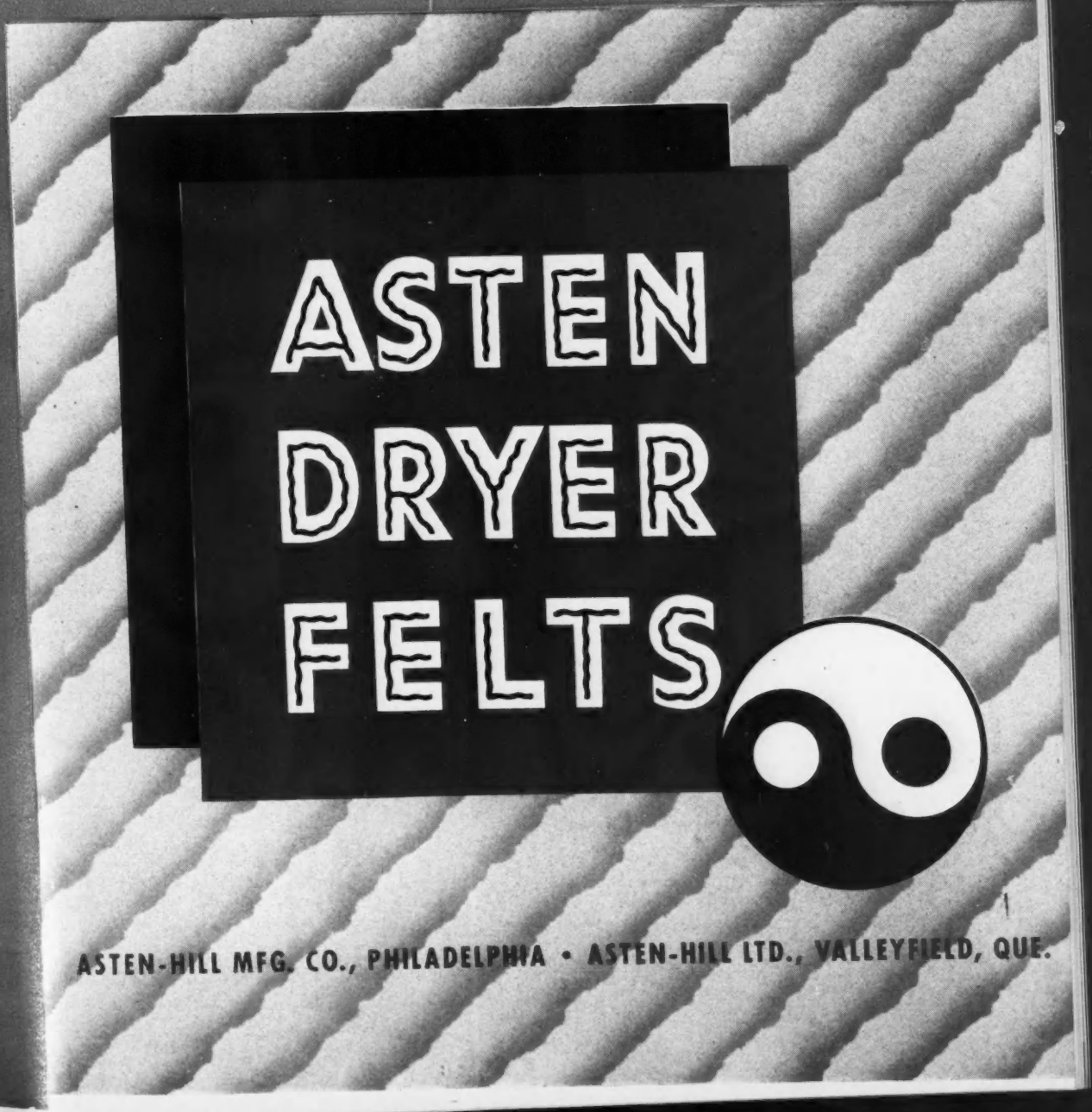
ENGINEERING LIBRARY

DEC 15 1948

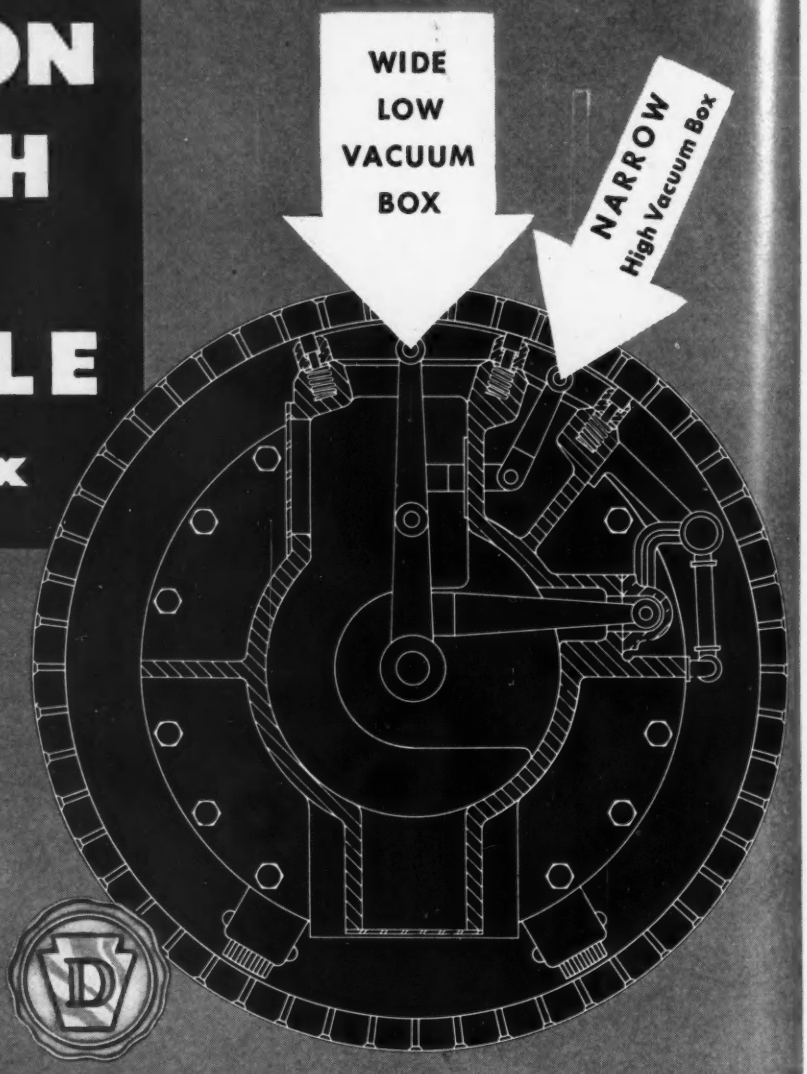
Paper TRADE JOURNAL

REG. U.S. PAT. OFF.

VOLUME 127, No. 24 DECEMBER 9, 1948



SUCTION COUCH with DOUBLE Suction Box



Combines virtues of a wide, low vacuum box and a narrow, high vacuum box in one roll . . . for high speed paper machines.

A Downingtown Suction Couch with a Double Suction Box, one a wide, low or moderate vacuum box, and the other a narrow, high vacuum box, has the following advantages: (1) Maximum water removal at the couch assures safer running thru presses at high speed. (2) Large suction area absorbs carry-overs from the flat boxes and helps prevent them from causing breaks. (3) Vacuum is applied gradually. In many mills, it has been found that if high vacuum is used in a single box, fibres are drawn into the wire, making it difficult to remove the sheet from the couch and sometimes causing picking of holes in the sheet. (4) Double box in one roll means that free air in the holes is not handled twice as would be the case with two rolls. (5) Minimum vacuum equipment and maximum water removal. . . . Write for more information.

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

Oldest Manufacturer of Modern Suction Rolls.

DOWNINGTOWN
Designers & Builders
Paper Making Machinery

PUBLISHED

EVERY THURSDAY

by

LOCKWOOD TRADE JOURNAL CO.

15 West Forty-Seventh Street
New York 19, New York
Telephone: Plaza 7-2370

•

GEORGE E. LOCKWOOD
President and Treasurer
ARTHUR E. GORDON
Vice-President
JOSEPH P. HORGAN
Secretary
H. G. HEITZEBERG
Editor
E. P. McGINN
Industrial Editor
E. P. NUTTALL
Assistant Editor
R. G. MACDONALD
"TAPPI" Editor
F. B. GROSSE
Production Manager

•

REPRESENTATIVES:

Eastern

BRUCE E. BROWN
EDWARD H. DOERING
15 West Forty-Seventh Street
New York 19, N. Y.
Phone: PLaza 7-2370

Mid-Western

H. K. VINTON
30 North Dearborn Street
Chicago 2, Ill.
Phone CEntral 6-2784

FRANKLYN H. OLSEN
4892 Oakland Drive, Lyndhurst
Cleveland 24, Ohio
Phone: EVergreen 5198

Pacific Coast

ROY M. McDONALD & CO.
564 Market Street
San Francisco 4, Calif.
Phone: YUkon 6-0503

639 South Wilton Place
Los Angeles 5, Calif.
Phone: Drexel 2590

Terminal Sales Building
Seattle 1, Wash.
Phone: Main 3860

Southern

EDWARD M. BUCK
1000 Main Street
Dallas, Texas
Phone: Riverside 5625

Scandinavian

Oxford Trading Aktiebolaget
Bibliotekgatan 6-8
Stockholm, Sweden

•

Subscriptions:

Payable in advance.

By the year, $5.00

Single copy 15 cents.

Canada, $7.00

Other Foreign countries, $8.50

MEMBER

DEC. 9, 1948 In This Issue

	Page
Paper Industry Points Pitfalls in FOB Policy	9
Industry Can Lead the World in Human Relations	10
Safe Shipping and Delivery of Newsprint Paper	12
Superintendents Association Honors Old-Timers	13
American Forestry Profession Adopts Code of Ethics	14
The Jonsson Screen and Its Application to a Variety of Stock Production Problems	17
Keeping Press Felts Fit for Today's High Speed Papermaking	19
Condensation of Round Table Discussion on Pulp Bleaching	21
Deinking Waste Papers With Sodium Peroxide	25
N. Y. Quartermaster Bids and Awards	38
MacKinnon Explains Conference Purpose	40
NSRB Sees Paper Industry's Guidance	46
The Application of a Flocculation Type Unit in Paper Mill White Water Treatment	57
The Relationship of Stock Preparation to the Formation of Sulphite Papers	59
The Inspection Specifications as a Quality Contract	60

DEPARTMENTS

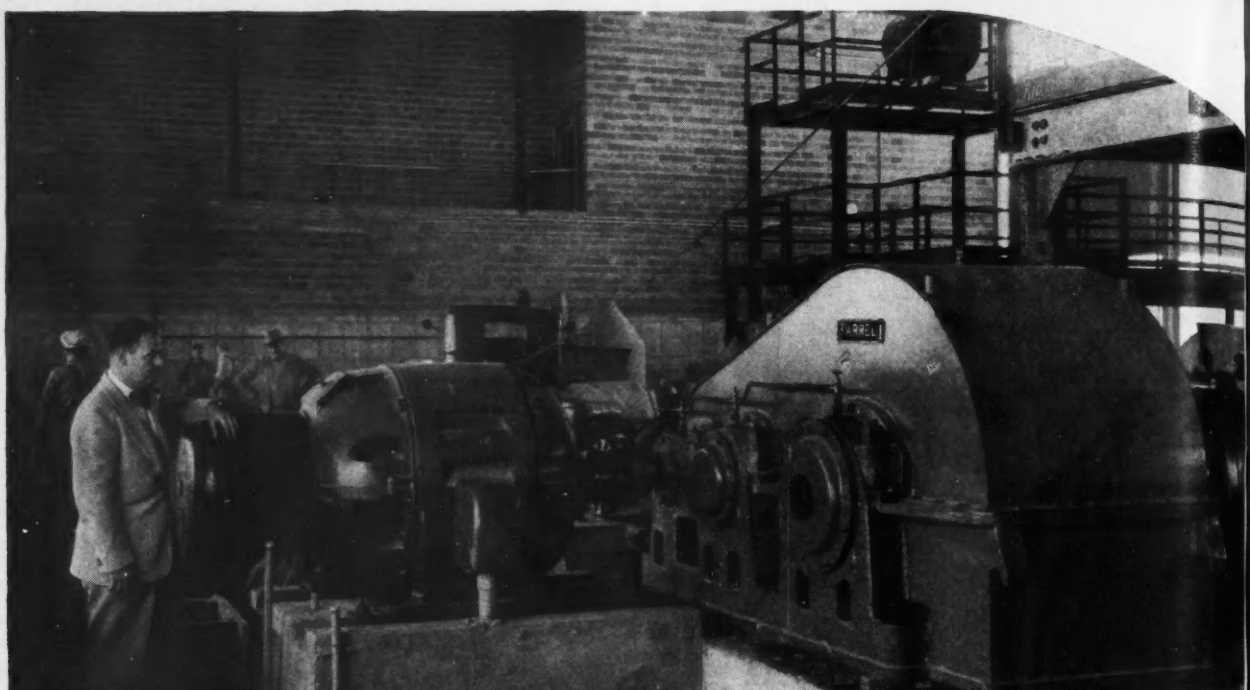
	Page		Page
Industrial Development Section	17	Financial Record	34
Literature	26	Meetings	36
Trends	27	Obituary	38
Imports	28	Production Ratio Report	50
Prices	30	TAPPI Section	57
Markets	32	Classified Advertising	64

INDEX TO ADVERTISEMENTS ON PAGE 78

Paper TRADE JOURNAL
Reg. U.S. Pat. Off.

VOL. 127 **NO. 24**

Entered as Second Class matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 N. Crystal St. East Stroudsburg, Pa. Printed in U.S.A. Copyright 1948 by Lockwood Trade Journal Co., Inc. PAPER established Feb. 17, 1899, combined with PAPER TRADE JOURNAL, Nov. 16, 1899. PAPER, established Sept. 21, 1910, combined with PAPER TRADE JOURNAL, February 19, 1926. All rights to the above titles reserved. Contents of PAPER TRADE JOURNAL, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission. PAPER TRADE JOURNAL is indexed in *Industrial Arts Index* and *Engineering Index*. Also publisher of LOCKWOOD'S Annual DIRECTORY OF THE PAPER AND ALLIED TRADES.



Falling water was a problem of the U. S. Rubber Reclaiming Co., Incorporated when they built a new plant at Buffalo, N. Y. Experience in their present plant showed that small fires triggered the sprinkler system and made motors inoperative. In planning the new plant, the need for motors shielded against falling water was recognized. Also, insurance officials required greater motor protection in the new plant —a need that was filled by Tri-Clad high-speed synchronous motors. Now, no production time is lost because of water in motors.

Dripproof construction with no direct openings above the centerline excludes falling water, dirt, and falling objects. Besides this, there are three extra protections that make Tri-Clad synchronous motors last longer.

Extra Protection Against Physical Damage—sturdy, rigid frames and end shields for protection against corrosion, accidental blows, and falling objects.

Extra Protection Against Electrical Breakdown—proved synthetic bonding and insulating compounds protect coils from heat aging, moisture, mild acids and alkalies. Insure longer life.

Extra Protection Against Operating Wear and Tear—redesigned bearings and bearing housings insure a permanent supply of cool, clean oil from sealed reservoirs.

Delivery on Tri-Clad high-speed synchronous motors and generators is good. Motors are available in ratings from 20 to 1500 hp at 1800 rpm speeds with proportionate hp ratings at speeds through 514 rpm. Generators from 1¼ to 1250 kva. For application engineering and delivery data, call your nearest G-E sales representative today. ***Apparatus Dept., General Electric Company, Schenectady 5, N. Y.***

GENERAL ELECTRIC

770-2

Paper TRADE JOURNAL
Reg. U.S. Pat. Off.

DEC. 9, 1948

VOL. 127, NO. 24

Paper Industry Points Pitfalls in FOB Policy

WASHINGTON—Paper company executives and representatives of at least one major chemical concern supplying soda ash to industrial consumers, early this week told a Senate committee that enforcement by the Government of an f.o.b. pricing policy on their concerns, in line with the recent Supreme Court basing point decision in the so-called cement case, would be ruinous to their businesses.

Appearing before the Senate Trade Policies Committee, which has been studying the effect of the court decision on various industries, E. P. Magel, president of the Crescent Paper Co., Indianapolis, declared that competitive conditions with respect to his company were such that if purchasers had to pay the transportation cost "that would be an insurmountable barrier" to sales of its products in certain market areas.

Recounting that his company's major competition on book paper from its suppliers at Cumberland Mills, Maine, to Indianapolis comes from distributors of a "very large book paper mill" in Hamilton, Ohio, only about 100 miles from Indianapolis, he said the practice of both mills had been to allow freight to point of purchase. He said transportation costs to date have not been a handicap to the company's merchandise costs.

"However," said Mr. Magel, "if the price at the mill for both lines of paper were the same and the purchaser had to pay transportation costs, we would be at a cost disadvantage of 48 cents per cwt. That would be an insurmountable barrier to sale" of the Maine papers in his area.

This example, said Mr. Magel, referred only to certain fine papers his company handled. He recited similar disadvantages that affect sales of its other paper products also.

D. K. Brown, president of Neenah Paper Co., Neenah, Wis., a converter, or non-integrated type mill, said "Our entire business has been built up on the basis of meeting competition in various markets and we feel strongly that a manufacturer should be permitted to pay any part or all of the cost of delivery in order to meet known competition."

"We believe that outlawing freight absorption would result in creating unemployment in our branch of the industry because the large consuming markets for our type of product are too far away and unless we can get our goods to these markets on a competitive basis it will definitely restrict our operations, and result in creating unemployment in communities where such converting mills as ours—and of which there are many throughout the country—are located," Mr. Brown said.

He emphasized that relocation of such plants as his "is an impossibility both from the standpoint of cost, and the natural resources and skilled labor required."

"It is our opinion that if freight absorption is to be prohibited many medium-sized communities in which so many converter type mills are located will suffer industrially," he warned, "and will in turn become poor markets for farm products in surrounding territory.

George Olmstead Jr., of Boston, speaking for the American Paper & Pulp Ass'n., told the committee that the industry cannot do business "unless it has the power systematically to meet the market price prevailing in any territory."

He said paper mills were necessarily located near forests and rivers—far from the paper markets. To meet competition, he argued, they must be able to pay part or all of the freight costs into certain areas.

"Because of recent court decisions and interpretations of existing laws, it is recommended that such laws be so clarified as to permit freedom of action by any individual manufacturer to sell his product on the basis that best suits his competitive needs, and that the general adoption, without collusion, of any system of selling by manufacturers of paper shall not be in violation of any such laws."

"We do not want and we believe it is not in the best interest of our industry and the country to have one system and one system only of selling," he continued. "We desire freedom of action to sell in the open market on that basis which best meets our competitive needs."

His statement was endorsed by numerous paper trade associations in the various categories, including newsprint, pulp producers, shipping sack, and various specialties.

At this hearing there later appeared L. K. Larson, sales manager of the Pulp Division of the Weyerhaeuser Timber Co., a West Coast producer of bleached chemical pulp for market. He pointed out that domestic market pulp as well as imports, are consumed chiefly in New England, the Middle Atlantic States and the Lake region, all far removed from the major production areas.

(Continued on page 52)

It is rumored that—

several paper mills have been visited by Federal Trade Commission investigators.

* * *

an organization identified to Paper Trade Journal *only as "Superior Pine Products" is contemplating a huge paper mill on the fringe of the turpentine belt in Georgia, pending the outcome of an injunction by the City of Macon against paper mills, relative to stream pollution.*

* * *

a pulp mill may be established in Quesnel, B. C. Premier Johnston mentioned this possibility in connection with hydro-power development of the Quesnel River. He estimated that the area would produce 600 tons of pulp daily, in perpetuity.

* * *

Idaho-Montana Pulp & Paper Co. is completing registration with the Security Exchange Commission in preparation for construction of a $15,000,000 pulp and paper mill at Polson, Mont., to have a daily capacity of 100 tons of mechanical groundwood, 100 tons of sulphate pulp.

Industry Can Lead the World in Human Relations

—E. G. Bailey, Retiring President, American Society of Mechanical Engineers, and Vice-President, Babcock & Wilcox Co., New York City, Tells 1,500 at ASMA Annual Meeting

NEW YORK—American industry and engineering can lead the world toward a solution of its problems of human relations, as they have led it through technical and economic progress toward a higher standard of living, E. G. Bailey, president of the American Society of Mechanical Engineers, told 1,500 members of the Society and guests at a dinner at Hotel Pennsylvania highlighting the 69th annual meeting on December 1.

At the same time Mr. Bailey warned industry that it must "improve itself from within," and said that industry "welcomes sound and constructive advice from all professions and classes of people."

Mr. Bailey, who is vice-president of the Babcock & Wilcox Co., and is known both here and abroad as an authority on power and fuels, spoke on "Engineering Opportunities in Industry." His address followed presentation of the Society's annual honors and awards.

James M. Todd, New Orleans consulting engineer, was presented to the gathering as the next president of the ASME. He was elected last fall and was installed at the close of the six-day meeting, on December 3.

Other ASME officers entering on new terms are—

Regional vice-presidents: Arthur Roberts, Jr., chief engineer, Lynchburg Foundry Co., Lynchburg, Va.; Forrest Nagler, chief mechanical engineer, Allis-Chalmers Mfg. Co., Milwaukee; Carl J. Eckhardt, professor of mechanical engineering and superintendent of utilities, University of Texas, Austin; and Albert R. Mumford, development engineer, Combustion Engineering Co., 200 Madison Avenue, New York.

As directors-at-large: Jacob A. Keeth, manager of power production, Kansas State Power & Light Co., Kansas City, Kan.; and Ralph A. Sherman, assistant director, Battelle Memorial Institute, Columbus, Ohio.

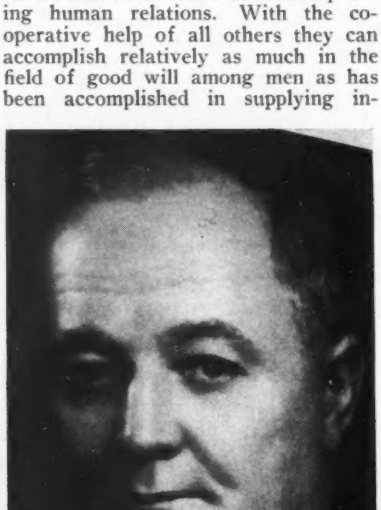
Progress in Temporal Things

Through science, engineering, and industry, man has conquered many of the forces of nature, enriched the world's supply of material goods and provided such services as power, transportation and communication, Mr. Bailey said. Man's standard of living has improved, but in the realm of human relations he has not made equivalent progress.

"Philosophy, education, religion and civic organization have made deplorably slow progress in promoting happiness and peace for mankind, while invention in chemical and mechanical development — so useful in bettering our temporal needs—has been turned to fashion for destruction when suspicion, hatred, and selfishness have caused outbursts of war.

"In modern warfare there is no longer a victor and a vanquished. Everyone loses — some possibly more than others — but a net loss is inevitable.

Declaring that there must be a course which can be followed to lead the world out of this savagery, he said that "the engineers and industrialists have made a real start toward improving human relations. With the cooperative help of all others they can accomplish relatively as much in the field of good will among men as has been accomplished in supplying increased varieties and quantities of goods and services by utilizing the forces and resources of nature."



JAMES M. TODD

—consulting engineer of 217 North Peters street, New Orleans, elected in the fall of 1948 as president of The American Society of Mechanical Engineers, took office on December 3 during the 1948 Annual Meeting of the society. . . . Mr. Todd, is a consultant in mechanical and electrical engineering. Specializing in air-conditioning, power plants and the equipment of large buildings and factories, he has been responsible for many important installations in the New Orleans and Houston areas. As vice-president and member of the board of the Jefferson Lake Sulphur Co., in charge of engineering, he has had mining assignments in Mexico and Central and South America. He is recognized as an authority in the mining and production of crude sulphur.

The answer to skeptics, the ASME president said, is evident in many companies today.

"The management has been building quietly but firmly and convincingly an excellent relationship between themselves, their employes, their customers, their stockholders and the community. Such companies exist in many different industries. They progressed to this status through real ability and leadership. What has already been done can be repeated extensively, until the great majority of all industry fits into this pattern, at which time the accomplishments will be unbelievably good."

Self-Propagating Management

A major change has taken place in management, Mr. Bailey said.

"It is now largely in the hands of competent men who have worked up within the industry and generally within the individual company. While the president or chief management officer is employed by and reports to a board of directors, nominally chosen by the stockholders, the management usually selects the nominees for directorships, and in fact runs the company. There is every reason why such self-propagating management should exist and continue as long as it is good and is satisfactory to the stockholders. This type of management will undoubtedly prove best in the long run in comparison with any previous form of manager-owner-employe relationship. . . .

"Industrial organizations, run on the basis of 'managerial enterprise,' seem to be the result of the evolution of good business and democracy, which have developed largely in the United States. This type of industrial organization will survive against all odds if we can realize the importance of properly training our young men to meet its opportunities and demands. Such training should start in the home and the church and continue through high school, college and industry."

Defining the engineer's place in this industrial picture, Mr. Bailey said that "the product is the life blood of a company. It must be kept healthy, and a source of pride and inspiration to every employe." The product or service must be kept "up-to-date and fairly competitive." Methods of manufacture must be studied to maintain or improve quality at minimum costs.

Decrying the tendency to regard the engineer as "fitted only for association with the drafting board, slide rule and

machine shop," the speaker said that the engineer's approach in his everyday work fits him admirably for "realistic analysis of problems, regardless of their source. Possibly he has been too reticent." He called upon the engineers to use their knowledge of basic engineering principles "in planning policies and solving the problems of human and public relations."

More Margin of Safety

A warning as to the future was issued by the speaker, who said that the "perpetual fountain called Industry" first provided the necessities of life, then the conveniences and luxuries and now "people continue to want all they have and more, expecting their desires to be supplied in profusion with fewer and fewer man-hours of labor."

Cautioning industry that there is "an ever-increasing need for good judgment in selecting projects for research," Mr. Bailey said:

"There seems to be an urge not only to gamble heavily that we are going to cash in on many spectacular dreams, but also to publish confusing statements well in advance of experimental work. . . . Many of our new projects are likely to come more slowly and more expensively than we expected. We might better use a little more margin of safety in depending on new ideas; at least we should not spend the savings until they are realized."

In labor-saving devices, industry must "inevitably face the law of diminishing returns." Industry of the future will require more of the engineering type of planning, Mr. Bailey declared. Top management should have a good foundation of fundamentals, and a long and realistic contact with gradually increasing responsibilities.

Offset Socialism, Communism

"It would seem to be entirely impossible for a socialized society to meet the requirements here set forth. To offset the world-trend toward socialism and communism it behooves industry to proceed along the path which is now being followed by the best companies, and even they should make further improvements in every facet and branch of their activities as fast as possible."

Unfinished Business

Industry has certain "unfinished business," said the ASME president. It should better understand and diagnose its good and bad points.

"It is the duty of industry to keep healthy and perpetuate itself as long as it can economically render a useful service to mankind. . . . It is incumbent upon industry to convince the public of its usefulness and integrity. . . . Industry must first learn and then teach its employes, its customers, and the public at large, many facts about fundamental economics." These facts, said Mr. Bailey, involve answers to the questions: "Can we continue to reduce working hours and add to spending hours without want? Can we snitch a ride going uphill, when we are supposed to do the pushing? Is feather-bedding honest? Can we find any other source of wealth than working or stealing? Can we classify all acquisitions as being one or the other? When will we realize that many of our ills are self-inflicted?"

E. DUANE STEWART

When the American Society of Mechanical Engineers conferred its annual honors and awards December 1, during the 69th Annual Meeting at Hotel Pennsylvania, New York. E. Duane Stewart, mechanical engineer with the West Virginia Paper & Pulp Co., Westernport, Md., received the Charles T. Main Award for a paper: "The Relation of Invention to Engineering."

New Haven Freight Cut

NEW HAVEN, Conn.—A rate reduction by the New Haven Railroad has brought about a daily saving of from $125 to $150 to paper manufacturers who ship their products from Holyoke to New York City. The reduction, amounting to five cents per 100 pounds of paper, originated with a joint request by the traffic managers of the Holyoke paper mills and the Sheldon Transfer & Storage Co.

Arthur E. Sheldon, treasurer of the trucking firm, points out that the rate slash applies to paper shipments only, and then on a 50,000-pound carload basis. The rate per 100 pounds had previously been 20 cents, he said, and the five-cent allowance brings the charge back to about what it was before the recent series of freight rate boosts.

The petition for the reduction made by the traffic men of the local mills and the Sheldon firm was based on maintenance of the competitive position of the paper firms of Holyoke and vicinity in the New York area. The cut was agreed to by the New Haven on the 50,000 pound carload basis, and the ICC gave final approval.

It is estimated that from five to six carloads of paper leave Holyoke daily under normal conditions. On this amount the Sheldon company hauls from one to three carloads to the freight yards here. This amount represents l.c.l., shipments made up into carload lots by the trucking company. Some of these loads come from as far as 50 miles to be loaded on cars at Holyoke. The remainder of the five-to-six carload total is accounted for by the products of manufacturers who make up their own carload lots.

Recknagel Addresses FPRS

VANCOUVER, B.C.—Sustained yield in regard to the timber crop has reached a stage where forest experts have a new conception and regard this activity in the nature of a program of "multiple-product recovery," A. B. Recknagel, technical director of forestry of the St. Regis Paper Co., of New York, stated at the recent fall meeting of the Forest Products Research Society here. He said the new conception meant that a market must be found for the needles, the bark and the roots as well as for the centre cut of tree, so that the forest yields the maximum return and leaves the least waste.

"There is little or no integration in logging the various forest products," he said. "We still use fiddle-butt spruce for pulp when it should be saved for sounding boards. We cull, and leave as waste in the woods, material which could be profitably harvested in multiple-product recovery."

Growth and cut in any forest, Mr. Recknagel said, can be balanced by cutting less and less, and therefore, he emphasized, sustained yield has merit only as it perpetuates the forest industries.

Added costs of production under sustained yield management must be offset by increased quality and quantity of the growing stock, he contended. "It means putting the forest before the mill, whereas the exact opposite has been the case," Mr. Recknagel commented. "The sawmill is still king, and a right royal wastrel he is."

Operating Wheeler Mill

HUDSON FALLS, N. Y.—The Manhattan Pulp & Paper Co., is operating the former mill of Wheeler Paper Corp., Tivoli Mills Division, making about 20 tons of soda and bleached sulphite pulp daily from de-inked waste paper.

The mill is owned by the Keystone Brokerage Co., New York City, of which John Re is president, and by the Doomsday Press, also of New York City.

George DeLano, formerly with the Wheeler Paper Corp., is superintendent. The equipment includes an American Machinery Co. pulper, Harmon screen, three-stage washer, and Rogers wet machine, for lap pulp. Sodium hypochloride is used for bleaching.

Safe Shipping and Delivery of Newsprint Paper

By EDWIN CHESTER HASTINGS
Edwin Chester Hastings Traffic Service, Pittsburgh, Pa.

One of the big problems of the paper industry is the safe shipping and delivery of newsprint paper. Perfect round rolls, correctly balanced, are delivered to the carrier, but somewhere in transit several of the rolls, unable to resist pressure, arrive at the destination unfit to use until reprocessed, if the latter is possible.

The problem of delivery to the user isn't limited to the shipper alone, nor to the distributor, but it concerns every party handling the paper.

A carload of several "flat" rolls upon arrival at the destination can be due to various conditions: (1) the shipper failed to block properly, (2) load shifted in transit, (3) rail carriers forbid crews to handle cars roughly, but train crews can and do improperly bump cars in shifting. This will jar the lading and in the case of rolls of newsprint, two slapped together will flatten one or the other. Neither the shipper or carrier wants to endanger the goodwill of their customers. The mill wants to sell its paper, it furnishes good stock and wants it delivered the same way. The carrier wants to deliver the lading to the mill's customer in proper condition. But there are sometimes employes of the mill and the carrier who are little concerned about the desires of the employer. Damaged stock is sometimes hard to trace to whom is responsible; attempts to trace it mostly end in a "dead-end" street, and the carrier has to pay the bill. Due to these conditions "flat" rolls are sometimes expected when the car arrives at the destination. Regardless, if the percentage is small or large, the situation becomes irksome no matter how one reconciles to the condition. A willingness of the carrier to pay damages doesn't entirely ease, nor help what is possible to avoid. Damaged stock even though paid for by the carrier is costly to the customer and involves delays in delivery. The carriers won't pay damages until after a thorough investigation and during the period of the settlement of the claim the damaged stock occupies needed space. Expensive labor is required to attempt to restore the rolls fit for use.

The system is unsatisfactory, for in some cases the rolls are impossible to restore for use. There is also a danger of concealed damage that may not be seen until the roll is placed in use in the newsplant. Discovery of damaged stock, weeks and months after delivery is sometimes too late to collect payment. It can develop into a long drawn-out controversy and a demand for proof, if any settlement is made. These things aren't helpful to the customer's patience nor good will.

Most rail carriers are members of the Association of American Railroads and the experts of the AAR have offered ideas of how rolls of newsprint that were flattened in transit may be restored to proper balance. These ideas when put into practice on small rolls may have had results.

Paper converters, with years in the business, claim that due to the weight, the AAR process of straightening "out-of-round" rolls (500 pounds or more) can't be done with the method of driving a mandrel (round shank) through the center hole. It is possible to get a round hole and not restore the roll to proper balance. Rolls out-of-balance when used slow the presses and the paper tears easily.

There are two possible ideas advocated by paper converters that may help to cut down this evil and reduce damages to a new low. One is to use a standard heavy paper case or jacket to protect the roll in transit. During the war, the paper industry produced cartons that withstood severe tests in the South Pacific. Vital merchandise for the armed forces, shipped in paper cartons, resisted weeks of rain. *They actually took the place of wooden cases* and converted the most skeptical military leaders after they saw fact cases on the beaches of various islands. That type of paper used in those cartons is not in universal use due to the material being expensive, but mass productive demand will lower the cost and bring a widespread use.

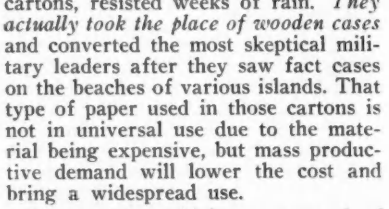
The jacket could be constructed of the same material used in paper pallets. Corrugated paperboard is strong and will resist pressure as note the following test of paper pallets:

Bristol-Myers make products sold on every drug counter in the country. They ordered paper pallets from the Chuckaway Co. and put the product to a severe test. Twenty-four 40' x 48's, each bearing 64 thirty-pound cartons of hand lotion in glass bottles moved by steamship from New York to the West Coast. The pallets only weigh six pounds and can support 2,000 pounds of lading (wood pallets weigh 100 pounds). The pallets are composed of a flat sheet of corrugated paperboard, supported by nine spiral-wound paperboard tubes. The lading loaded at the plant, lifted by fork trucks to the floor of a motor van. Unloaded at the pier, stowed in the hold, still on pallets. At the West Coast the cartons were removed, traveled by trucks to warehouse and *the original pallets were still in good condition.*

If the material used in those pallets can stand that test, it is certain a strong tubular case could be made to protect newsprint rolls in transit. The added expense will more than protect the cost when contrasted with certain damages. Most paper men agree that the heavy wrapper used at present on these rolls can be improved to withstand more strain in pressure from other lading. It is also suggested a wood frame or round crate with ends will protect but also add to the weight. One end could act as the pallet.

Some mills use wood cores, while others use metal cores. The latter can stand more punishment but there is nothing to prevent a short core from turning, regardless of the material used. The idea of the paper jacket was suggested to a converter who had just received a car of newsprint, weight 70,000 pounds, value $10,000. In the car all the rolls were on wood pallets. The firm use a fork-lift truck to unload and move to spot wanted. Several of the rolls were flat. And while the "jacket" seemed practical to prevent damage, the firm advocates that all mills use a full-length metal core. This type of core would stop the collapse of the center of the roll and the firm also believed a jacket would not be necessary. Since there is more paper available, the firm buys from those mills using a metal core. Arrangements have been made with the mill to return these cores freight collect.

What metal should be used for a solid core? If the material is steel, even a hollow tube of spring steel will add to the weight and be expensive. A good strong material and light in weight is aluminum. This metal is



GOODYEAR APPOINTMENT

Appointment of West Coast and Chicago district managers for the chemical division of The Goodyear Tire & Rubber Co. is reported by H. R. Thies, division manager. . . . R. T. Hickcox, left, above, has been named West Coast manager with headquarters in Los Angeles, and C. O. McNeer right, above, at Chicago. Both men were with the plastics and coatings department, from which the new chemical division was formed.

SUPERINTENDENTS ASSOCIATION HONORS OLD-TIMERS

These Old-Timers were among those honored at the annual old-timers banquet of the Michigan Division of The American Pulp & Paper Mill Superintendents Ass'n., Inc., Hotel Harris, Kalamazoo, Mich. November 18. Seated, left to right are: Roy H. Kelly, Rothschild, Wis.; Carl Magnus, Wausau, Wis.; E. T. A. Coughlin, Richland, Mich.; and John H. O'Connell, Washington, D. C. Standing: Raymond L. Barton, Plainwell, Mich.; William H. Brydges, Lynchburg, Va.; Allan B. Milham, former Bryant Paper Co. president and now a member of the City Commission of Kalamazoo, toastmaster; Grover Keeth, Rothschild, Wis., and Peter J. Massey, River Forest, Ill. Mr. Massey was the first secretary-treasurer of the Association.

worth about 40 cents per pound and a core of full length would probably weigh about five pounds. An initial investment of two dollars per core will in the end more than save in damages to a roll without center protection.

Objections may be raised to the long metal core on the basis that mills will have to buy constantly to have an excess stock, also slow returns of the empty cores from the consignees. This condition could be relieved to some extent by specific instructions, and by adding to the cost of the order the deposit for each core used. When the cores are returned to the mill, the buyer's account to be credited for the deposit. A firm buying from the same mill will naturally return the empty cores when reordering. The mill can protect its investment in metal cores and be sure of the returns if the customer is charged and billed the full value of the core. The amount backed by an understanding with the customer will only be crossed off when the cores are returned. The mills can protect their property with the firm's name and address permanently impressed on the cores. A reliable mill, wishing to keep a good reputation, would hardly roll paper on the core owned by a competitor if cores were sent by mistake to the wrong paper mill. The customer making the error wouldn't gain as the mill to whom the cores rightly belong won't credit his account until their cores are returned.

It is granted the heavy paper jacket and the full length metal core may not solve every problem nor bring about a "perfect shipping" for paper rolls, but any practical method that will reduce damages is worth striving to see if it is workable.

There are about 1,000 railroads in this country and the freight claim divisions of each of the roads recommend the following to prevent damages to newsprint paper in loading and unloading:

Careful inspection should be made by shippers after the cars are set for loading and any car that in the opinion of the mill inspector is not fit for paper should be rejected. Car floors should be swept and cleaned thoroughly, and all protruding nails drawn or driven into the floor, *not bent over.* Car floors should *not* be papered as this increases the possibility of the load shifting. Many instances have been recorded of paper having been damaged by rain or snow driven in at the tops of doors, or whipped up under the doors. Shippers should take steps to prevent such damage by applying strips of wrapping paper across both the bottom and top of the doors and battening the strips to the door posts on both sides.

Slack wrappers cause chafing damage. All rolls should be wrapped tightly and edges securely glued and folded and sufficient wrapper of good quality should be used as protection against damage in transit. Minimum of one-ply body wrapper extending nine inches beyond each end of the roll. Folds of the body wrapper and bands should be crimped over end of roll evenly, to avoid uneven pressure on bottom of roll while in upright position. Sufficient endbands of paper should be used to provide at least four thicknesses on bottom and two on top, including body wrapper. A minimum of two inside heads on the bottom of each roll and one inside head at the top of each roll, fully covering the white paper, is strongly recommended.

A truck especially adapted to provide ample protection for the edges of the rolls should be used for the trucking in and out of the cars. A truck having a hinged nose or shoe is recommended. The doorways of cars should be so loaded (or spotted) that the cars may be unloaded from either side.

The following are practices in handling at destinations which create damages to newsprint paper: (1) Dropping from freight car to motor truck, or from motor truck to pavement or elevator platform or over sharp edges of platform. (2) Permitting projections on motor trucks or chutes. (3) Rolling over uneven and unclean floors. (4) Balancing rolls on their edges in order to insert tilting board to raise roll sufficiently to insert truck shoe. The use of a tilting board is not necessary. (5) Dumping rolls off hand trucks without use of incline. (6) Improper use of prying paddles; they must not be used at an angle. (7) Improper use of pulling rope which cuts the upper edge of the roll when it is not fastened high enough on the toggles to clear. (8) Use of unsuitable hand trucks with rigid blades or lips without benefit of tilting shoe to protect edge of roll.

Newsprint is heavy (many rolls 1,300 pounds for the smalltown newspaper and those of larger cities using rolls from 2,400 to 2,700 pounds), and the nature of it suggests careful handling. Proper steps should be taken to impress railroad men with this necessity. It is also desirable to inform employes of transfer companies, warehouses, and newspaper publishers.

American Forestry Profession Adopts Code of Ethics

WASHINGTON—A code of ethics for the forestry profession has been adopted by the Society of American Foresters, the members voted by letter ballot in November.

The newly adopted canons will be broadly construed in the interest of the public welfare and professional advancement, a Society spokesman said, adding that they are now deemed to be duties, obligations, and responsibilities of the technical forester to all those with whom he comes into contact in the course of his professional work and life.

The Society of American Foresters, organized in 1900, has a membership of 6,000, in the United States and Canada.

The code of ethics is as follows:

Code of Ethics for the Profession of Forestry

The purpose of these canons is to formulate guiding principles of professional conduct for foresters in their relations with each other, with their employers, and with the public. The observance of these canons secures decent and honorable professional and human relationships, establishes enduring mutual confidence and respect, and enables the profession to give its maximum service.

Professional Life

(1) The professional forester will utilize his knowledge and skill for the benefit of society. He will cooperate in extending the effectiveness of the forestry profession by interchanging information and experience with other foresters, and by contributing to the work of forestry societies, associations, schools, and publications.

(2) He will advertise only in a dignified manner, setting forth in truthful and factual statements the services he is prepared to render for his prospective clients and for the public.

Relations With The Public

(3) He will strive for correct and increasing knowledge of forestry and the dissemination of this knowledge, and will discourage and condemn the spreading of untrue, unfair, and exaggerated statements concerning forestry.

(4) He will not issue statements, criticism, or arguments on matters connected with public forestry policies, without indicating, at the same time, on whose behalf he is acting.

(5) When serving as an expert witness on forestry matters, in a public or private fact finding proceeding, he will base his testimony on adequate knowledge of the subject matter, and render his opinion on his own honest convictions.

(6) He will refrain from expressing publicly an opinion on a technical subject unless he is informed as to the facts relating thereto, and will not distort or withhold data of a substantial or other nature for the purpose of substantiating a point of view.

Relations with Clients, Principals, and Employers

(7) He will be loyal to his client or to the organization in which he is employed and will faithfully perform his work and assignments.

(8) He will present clearly the consequences to be expected from deviations proposed if his professional forestry judgment is overruled by nontechnical authority in cases where he is responsible for the technical adequacy of forestry or related work.

(9) He will not voluntarily disclose information concerning the business affairs of his employers, principals, or clients, which they desire to keep confidential, unless express permission is first obtained.

(10) He will not, without the full knowledge and consent of his client or employer, have an interest in any business which may influence his judgment in regard to the work for which he is engaged.

(11) He will not, for the same service, accept compensation of any kind, other than from his client, principal, or employer, without full disclosure, knowledge, and consent of all parties concerned.

(12) He will engage, or advise his client or employer to engage, other experts and specialists in forestry and related fields whenever the client's or employer's interests would be best served by such actions, and will cooperate freely with them in their work.

Relations with Professional Foresters

(13) He will at all times strive to protect the forestry profession collectively and individually from misrepresentation and misunderstanding.

(14) He will aid in safeguarding the profession against the admission to its ranks of persons unqualified because of lack of good moral character or of adequate training.

(15) In writing or in speech he will be scrupulous to give full credit to others, in so far as his knowledge goes, for procedures and methods devised or discovered and ideas advanced or aid given.

(16) He will not intentionally and without just cause, directly or indirectly, injure the reputation or business of another forester.

(17) If he has substantial and convincing evidence of unprofessional conduct of a forester, he will present the information to the proper authority for action.

(18) He will not compete with another forester on the basis of charges for work by underbidding through reduction of his quoted fee after being informed of the fee quoted by a competitor.

(19) He will not use the advantages of a salaried position to compete unfairly with another forester.

(20) He will not attempt to supplant another forester in a particular employment, after becoming aware that the latter has been definitely engaged.

(21) He will not review the work of another forester, for the latter's employer, without the other's knowledge, unless the latter's connection with the work has been terminated.

(22) He will base all letters of reference or oral recommendation on a fair and unbiased evaluation of the party concerned.

(23) To the best of his ability he will support, work for, and adhere to the principles of the merit system of employment.

(24) He will not participate in soliciting or collecting financial contributions from subordinates or employees for political purposes.

(25) He will uphold the principles of appropriate and adequate compensation for those engaged in forestry work, including those in subordinate positions, as being in the public interest and maintaining the standards of the profession.

BROWN CO. HOLDS PULP SALES MEETING

Members of the Pulp Sales division and representatives of the production department of the Brown Co. and Brown Corp., its Canadian subsidiary, were assembled in New York for their Annual Meeting during the week of November 15. . . . Seated, left to right—H. J. Humphreys, Canadian sales manager, Brown Corp.; John J. McDonald, assistant manager, Pulp Sales division, New York; Newton L. Nourse, manager, Pulp Sales division; H. S. Chellis, New England representative, Pulp Sales division; M. A. Hescock, New York representative, Pulp Sales division. . . . Standing, left to right—L. M. Cushing, pulp mills manager, Berlin, N. H.; John A. Elton, manager, foreign department, New York office; Paul M. Goodloe, technical service department, New York; Milton Hayes, production control manager, Berlin; Henry A. Eaton, production manager, chemical and floc plants, Berlin; Tom Reiling, technical service department, Chicago; Cameron Duff, assistant Canadian sales manager, Brown Corp.; Warren Beckler, manager, pulp mill, LaTuque, Quebec; Frederick C. Stakel, manager, advertising and sales promotion; Robert M. Cleland, assistant to sales manager, Pulp Sales division; W. L. Gilman, Chicago representative, Pulp Sales division.

Two New Merit Men

BOSTON—The Merit Paper & Chemical Corp., has two new representatives; Douglas P. Leaman, covering the North Shore, and Fred Slater, covering Metropolitan Boston.

The Jonsson Screen and Its Application to a Variety of Stock Production Problems

By SVEN FAHLGREN

Sales Engineer, Bird Machine Co., South Walpole, Mass.

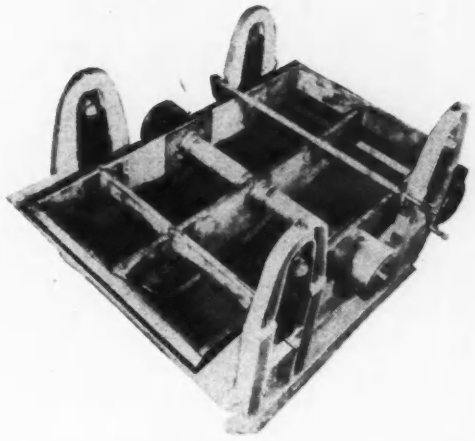
Very likely many of you, here at this meeting, think of the Jonsson screen as a relatively new item of pulp or paper stock-handling equipment and for that reason may be interested in hearing something about its operation and its numerous applications.

Vibrating screens of various types have been extensively employed for years, in the mining and rock products industries among others. It is, however, true, so far as we know, that this type of screen had never been applied in the pulp and paper industry until the development of the Jonsson screen.

A Jonsson screen was brought over from Sweden, where it had been first introduced in the pulp mills, at least a dozen years ago, and that original screen knotted something like 200,000 tons of sulphite stock before it was retired in favor of another Jonsson screen of up-to-the-minute design now being built in this country by the Bird Machine Co.

Perhaps you are already familiar with the construction and operating principles of this Jonsson screen. In any event I can cover it in a few words. The screen consists essentially of an open trough or vat divided into two or more sections. The bottom or floor of this trough contains a screen plate, either perforated or slotted. The entire unit is suspended on four powerful springs. An off balance shaft, driven through V-belts by a 3-HP motor, imparts an intense but precisely controlled circular, vibratory motion to the trough.

A noteworthy and exclusive patented feature of the Jonsson screen is the design of this trough. It has a special shape that effects partial submersion of the screen plate and encourages quick and complete transport of rejects from feed to discharge. The only contact the rejects have with the screen plate is where the plate emerges from the stock. The plate is virtually horizontal at this point. It is practically dry. It represents no more than 15 percent of the total screening area. It interposes no obstacle to rapid movement of rejects to the point of discharge. A shower at the discharge end whisks out



Jonsson screen.

the few good fibres adhering to the knots or rejects. Loss of fibres in the tailings is amazingly small—very much less than pulp makers are accustomed to expect. In one mill Jonsson knotters saved as much as three tons of fibre per day.

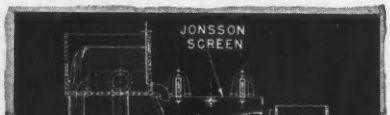
Rapid removal of rejects is a key factor of screen performance. In the Jonsson screen there is no opportunity for knots, shives or dirt to bounce around on the screen plates and get broken up into fine particles that get through and are difficult to remove later on. To illustrate how fast the stock is handled by the Jonsson screen, 100 tons of pulp per 24-hour day at .95 percent consistency, requires a flow rate of 1,750 G.P.N. A Jonsson screen with a quarter-inch diameter perforated area of only 16 square feet, easily handles this large volume.

The Jonsson screen first proved itself as a knotter on sulphite stock. One hundred tons per day is average capacity, using quarter-inch diameter holes. Capacity varies somewhat, of course, with the type of stock, its freshness and the percentage of rejects in the stock. The

Presented at the Joint Fall Meeting of the Southern & Southeastern Divisions of the American Pulp and Paper Mill Superintendents Association, at Atlanta Biltmore Hotel, Atlanta, Ga., Oct. 21, 22, 23, 1948.

INDUSTRIAL DEVELOPMENT

Paper Trade Journal, in this section, makes space available for discussion of technical and operating problems. Space is also available for the presentation of independent studies and research on technical and engineering subjects. Feature stories of paper mills, converting plants and inter-related industries will be included. An invitation is cordially extended to all who are qualified to discuss these subjects. Original manuscripts submitted exclusively to Paper Trade Journal and found suitable for use in this section will be paid for immediately upon acceptance. Submit manuscripts to E. P. McGinn, Industrial Editor.



Schematic diagram showing Jonsson screen in system.

best consistency for sulphite knotting is generally around 0.9 to 1.1 percent.

At the risk of being accused of bias because of my interest in the Bird consistency regulator, I'd like to say that consistency control ahead of the knotter, regardless of what type of knotter is used, is exceedingly desirable. It ought to be a "must" in every installation. I will point out, however, that the Jonsson screen has the ability to accept greater consistency variations than other types of knotters without the loss of good pulp in the rejects.

While we are on the subject of sulphite stock, I'd like to mention the application of Jonsson screens with slotted plates for fine screening. I know of one mill in the East that has about a dozen of these screens in that type of service. The screening area of one Jonsson screen is about the equivalent of six ordinary flat screen plates. Operating with a customary overflow of ten to 20 percent the Jonsson screen with .010" cut plates has a capacity of 11 to 12 tons per hour or about two tons per screen plate. Fine screening can be accomplished at knotter consistency (0.8 to 1 percent) without adding water between the two stages.

Getting back to the subject of knotting for a moment, sulphate stock is handled by Jonsson screens both before and after vacuum filters. It has been, and still is in many cases, the customary practice to knot wood pulp after it has passed over the vacuum washers. The use of ordinary rotary knotters ahead of the washers was prohibited by excessive foaming. You can imagine the problem presented by Southern kraft, for example.

Due to the special shape of the Jonsson screen trough, stock is readily knotted before the black liquor is removed. A special submerged inlet is employed and open head boxes are dispensed with. The stock is totally enclosed from the blow-pit to the knotter and streamlining the transfer area keeps the stock from cascading and mixing with the air. Close connection to the brown stock washers is recommended although it is not absolutely necessary.

The intense vibrating action of the Jonsson screen tends to kill foam and use of higher stock consistency also helps. A consistency of 1.5 percent is ideal for knotting soda pulp and Northern kraft. Consistencies as high as 1.7 to 2 percent are recommended for that superfoaming Southern kraft.

The advantages of delivering brown stock to the washers free of knots and chips are obvious. Washing efficiency is markedly increased. Maintenance of better, more uniform vacuum is assured. A substantial increase in black liquor recovery follow.

Squeeze rolls may be used on the filter drums to obtain maximum removal of black liquor because there is no longer the possibility of damage to the wire cloth as there would be with stock full of knots and chips.

Knots rejected by the Jonsson screen may be returned for further cooking or put through a defibrating unit.

The savings resulting from knotting ahead of brown stock washers are substantial. One mill estimates savings in salt cake amounting to ten cents or more per ton of pulp. Reduction in the quantity of alum used as a neutralizing agent in the paper mill adds to the savings.

One Jonsson screen having a total screening area of 16 square feet and equipped with a ⅜-inch diameter perforated screen plate will handle 100 to 150 tons of kraft per 24 hours. For the knotting of soda pulp, quarter-inch holes are employed. Capacity varies, of course, with the proportion of knots and uncooked chips in the stock. Excessive amounts, resulting from very raw cooks, will bring down the screen capacity to nearer 100 tons.

The practice of knotting ahead of brown stock washers is becoming so widespread, and its advantages are so outstanding, that it bids fair to become standard practice throughout the industry.

Groundwood knotting is also a job for the Jonsson screen. When the mill layout permits, bull screening and knotting can be combined to excellent advantage in the Jonsson screen. It gets the long, narrow slivers that are apt to get through with the stock in other types of knotters. Knotting capacity is on the high side; up to 150 tons per 24 hours, through quarter-inch diameter holes is not at all unusual. Consistencies as high as 2¼ percent are easily handled.

Fine screening of groundwood using perforated plates of .0625-inch diameter or smaller awaits only the assurance of the ability of plates to withstand the necessary vibration. It looks as if they would be available in the near future, if not immediately. Horsepower per ton of accepted stock shows a great reduction in favor of the Jonsson screen; as little as .108-HP per ton. Compare this with the power required for other types of fine screens. Suffice to say at present, that Jonsson screens are now operating as fine screens on groundwood and the performance of the plates is being checked. You are going to hear more about this application and its possibilities.

The screening of Asplund Defibrator stock and Masonite stock has always been somewhat of a problem because of the coarseness of the stock and its exceptionally high freeness. It is important to select the proper open screening area in order to prevent matting and loss of capacity. We have found that cutting down the open area from, say 28 percent to 14 percent, we doubled the capacity. Perhaps too much open screening area drains the water off too fast and permits the fibres to form a

heavy mat that walks over with the rejects. At any rate we get a capacity of 50 tons per 24 hours with a ⅜ inch diameter perforate plate and about 25 tons with a 5/16 inch plate. These capacities increase as the degree of refining is increased. Jonsson screens ahead of the refiners for final treatment effect considerable power savings. With selective screening the accepted stock from the final line may in many cases be of sufficient quality to dispense with further refining. The rejects from the primary and secondary screens may go to a refiner and back to the primary screens.

Coarse screening of these kinds of stock is common enough, especially in the Scandinavian mills and I notice that a new mill being built in Mexico is going to screen its defibrator stock.

The Jonsson screen has become the accepted screen for board and filler stocks. Strawboard offers an interesting example and the screening problem used to be considered a major one. Jonsson screens are now being used in large numbers on straw stocks and seem to have the problem licked. One big mill with these screens ahead of each machine increased production 7½ percent due to reduction in machine breaks. Knuckles and cockle burrs are easily rejected. They used to get as many as 18 breaks a day. Now 24 hours uninterrupted production is not uncommon.

Waste paper and de-inked stocks have occupied an increasing share of the limelight recently because of pulp scarcities and high costs. The removal of all undesirable matter—wet strength paper, cellophane, paper clips, rubber bands and so on, is easily effected with the Jonsson screen and this with virtually no loss of good fibres. On cylinder machines, one screen per mould handles all the stock.

Jonsson screens are replacing rifflers in some cases and used after the rifflers in others to get greatly increased production from fine screens by removing the foreign matter that would otherwise clog up the screen plates.

That will give you some idea of the possibilities of these screens. We've hardly touched upon selective screening and there may be other things that can be accomplished with a screen of its already demonstrated effectiveness, workability and capacity. However, let us leave these for future observation and experiment.

Keeping Press Felts Fit for Today's High Speed Papermaking

By BLANCHARD D. WARREN
Assistant Sales Manager, Bird Machine Co., South Walpole, Mass.

High-speed production is the order of the day. The fast-running kraft machines operating here in the South have opened the eyes of the rest of the industry to the possibilities of high-speed papermaking and have blazed the trail, so to speak, for a paper industry of ever-increasing value and importance to national welfare and progress.

High-speed paper machine operation naturally develops production problems as well as advantages and economies. One of these is, obviously, the greater necessity for avoidance of midweek shutdowns, for the higher the machine output per minute the greater the loss of production per minute of "down" time.

Probably the principal factor in continuity of machine operation is the press felts. And it is the matter of gearing these felts to superspeed operation and keeping them up to the pace of the paper machine that I propose to discuss.

Without some sort of continuous conditioning it's easy to imagine that the felts would soon defeat the purpose of high-speed operation. Naturally they would fill up faster than ever and it would be no time at all in many instances before the machine would have to shut down and the clogged felts washed so that they could resume their function.

I am happy to report, however, that this impending obstacle to continuous, high speed production has never materialized because developments and improvements in continuous felt conditioning have anticipated this situation and it has been possible to maintain the efficiency and absorbency of felts traveling at high speeds no less effectively than has been the case with smaller and slower-running felts.

"Jordan" type box of Vickery felt conditioner.

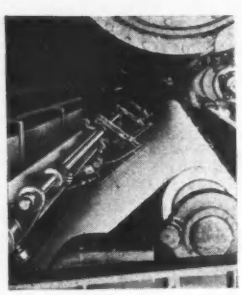
For the benefit of those who may not have had first hand experience with felt conditioners I'd like to take a moment to describe how they operate. The apparatus consists of one or more conditioning boxes mounted on a "V" slide supported by fixed bearings on each side of the paper machine. The number of boxes depends on the width of the felt. Each conditioning box is engaged through its mounting with a screw operated by a driving and reversing mechanism usually driven from the press roll shaft on slow speed machines but generally driven from felt rolls in the case of the big, fast-running machines such as you have for Southern kraft. These con-

Presented at the Joint Fall Meeting of the Southern & Southeastern Divisions of the American Pulp and Paper Mill Superintendents Association, at Atlanta, Ga., Oct. 21, 22, 23, 1948.

ditioners may be installed at some distance from the press rolls.

Now this means that the rolls that drive the conditioners are of relatively small diameter. To take care of this situation we have developed a high-speed gear box that takes the high number of r.p.m.'s from the felt roll and translates them into the reduction necessary for transmitting just the right operating speed for the conditioner. Remember this, if you encounter any difficulty in hooking up conditioners with felt rolls where they might have formerly been driven from the press roll. All you need is the new high-speed gear box and you're all set.

Now, as you see, to each conditioning box there is a hose connected to supply warm water and another connected to a vacuum supply. The conditioning box or "shoe," as it is sometimes called, operates on the working face of the felt and its gradual travel across the felt means that every portion of the felt is subjected to clean-



Vickery felt conditioner in operation on a press felt.

ing and conditioning. The warm water is ejected through one or more nozzles within the conditioning box, forced through the felt and pulled back again by the vacuum. The water executes a quick hairpin turn which *conditions* as well as cleans the felt. Travel of the felt across the conditioning box brings this action to bear on all the vertical or weft threads and travel of the conditioning box across the felt at right angles causes the same action on all the horizontal or warp threads.

What happens is that the threads are twisted or rolled slightly, relative to each other, so that the nip of the press rolls and the pressure of the felt rolls is not always exerted on the same part of the thread. This overcomes the flattening and hardening effect on the felt is kept continuously soft and porous and in condition to do its job as well as new.

The conditioning box can be moved rapidly by hand if dirt or grease spots get on the felt and need to be removed quickly. A clutch release is provided to permit movement of the box and to hold it at the desired point on the felt until the spot is removed.

Again, keeping in mind that most of you here are interested in high-speed operation, I want to tell you that a design of conditioning box has been developed to meet the extraordinary requirements for conditioning felts that pass over the boxes at a high rate of speed. I am referring now to the new "Jordan" type conditioner box. This is longer and has many more openings than the box used on ordinary paper machines. You will notice there are five small slots in the center between the large air openings. These are for warm water introduction. The water goes through the felt and back in a hairpin turn five times as the felt travels across the shoe. The large openings and the holes near the edges suck in the water and flex the felt. More water can be sprayed into the felt and higher vacuum is employed without danger of wrinkling the felt even at the highest speeds. The conditioned felt is able to absorb all the water squeezed out of the sheet.

This "Jordan" type box uses eight gallons of water per minute at 90° to 100° temperature. Vacuum is 100 cubic feet per minute with 13 to 15 inches of vacuum.

A lot of these "Jordan" type conditioner boxes are on the job in mills in this section of the country and are proving exceedingly satisfactory for high speed operation and also when the conditioners are installed on more or less vertical felt runs. They're easy to apply to conditioners now equipped with the ordinary vacuum boxes. All that is necessary is to be sure that the supply of warm water and vacuum is adequate. With the standard type of box three gallons of water per minute at 15 to 20 lbs. pressure and 90° to 100° temperature is average as compared to the above mentioned eight gallons per minute for the "Jordan" box. Vacuum for the standard box is 30 to 40 cubic feet per minute, employing three to five inches of vacuum as compared with 100 cubic feet per minute and 13 to 15 inches of vacuum with the "Jordan" box.

I hesitate to make definite predictions about felt life in the case of conditioned versus unconditioned felts because operating conditions are so varied that it is impossible to generalize. The fact is, however, that there is considerable operating evidence in favor of conditioning. One big machine running 1,200 ft. per minute and employing conditioners with the "Jordan" type boxes reports an average felt life of 12 days as compared with a former average of 6.4 days. The mill says that when it has the conditioners running on all felts on its four big machines it expects to save something like $100,000 a year.

Another mill tells us it is getting 320 to 330 hours out of felts where it never used to get more than 200 hours before using conditioners with "Jordan" type boxes.

Let me sum up, briefly, the advantages of continuous felt conditioning and then I'll let you fire away with any questions you may have on the subject and will do my best to give you some kind of an answer.

It stands to reason that no felt can stay clean and uniform of its own accord while it is running on the machine. When it is new its makers have put into it all of the qualities needed to make it a perfect carrier for the delicate, water-saturated paper web. It is soft. It takes the web through the nip without marking it. It is porous, so as to absorb a maximum amount of water at the presses, where it can be removed ten times cheaper than at the dryers.

But consider what is bound to happen after the felt has been running for awhile. Repeated passage through the press nip flattens the nap and flattens the threads. Then they harden that way. This affects the ability of the felt to drain the water from the sheet evenly. The loose fibres, filler and process dirt begins to accumulate on the felt as it would on a filter cloth and it finally becomes clogged. Its resiliency lessens. In time it becomes almost impervious. Water remains on its surface in front of the nip, saturating the oncoming sheet and resulting in "crushing." Uneven water extraction has a bad effect on paper quality.

Finally, things get so bad that the machine has to be

stopped and the felt washed and roped. Production hours are lost. Roping does little to restore the resiliency of the felt and washing shortens felt life. Effective felt runs get shorter and shorter until the felt has to be discarded altogether. But with conditioners the felt is kept clean and absorbent as new, continuously. Shutdowns for felt washings are eliminated. The moisture content of the sheet as it leaves the presses is not only reduced, but is constant, so that uniform drying and improved paper finish results. Drying is faster and the saving in steam at the dryers may prove very substantial.

Condensation of Round Table Discussion on Pulp Bleaching

Panel Members: Vernon Woodside, Mathieson Chemical Corp., Niagara Falls, N. Y.; R. L. McEwen, Buffalo Electrochemical Co., Buffalo, N. Y.; John Schuber, Solvay Process Division of Allied Chemical & Dye Corp., Syracuse, N. Y.; and L. E. Russell, Mathieson Chemical Corp., Niagara Falls, N. Y.

Mr. Woodside: I guess all of you gentlemen know John Schuber, to my left, with Solvay Process, Division of Allied Chemical and Dye.

This is Mr. R. L. McEwen, of the Buffalo Electrochemical Co., and I am Woodside, Mathieson Chemical. John Noble is not here now, but will join us shortly, and we will also have Mr. Russell of the Mathieson Corp., who will answer questions on sub-bleaching, if there are any.

What we want to do is get as much information as possible across to you, so please ask us questions. There are no prepared talks; no great discoveries we want to discuss, particularly in a formal paper; but if you have any questions or any problems in your own bleach plant which you have thought about, or have reason to be worried about, please put them to this panel and we will give you our very best answer and opinion and judgment on the thing.

Mr. Schuber: Mr. Woodside, I know that quite a number of you are interested in the chlorination stage, being the first stage in the process, and I think it apropos to start on that basis.

It has been standard thought that the chlorination stage should take place at a low consistency and we are probably all in agreement that three to three and one-half per cent is desirable. But there has been some disagreement as to what to do with the chlorination water and the temperature of chlorination stage. I think the superintendents and managers here who are interested in bleaching must have some ideas about that, and I wish you would ask questions, because if you don't I am going to ask you a question.

Mr. W. McHale: John, we have the problem of the temperature being too high in the caustic soda stage, and I believe we are running 110°F. and are trying to cut it down to 90°F. Chemically, just what goes on there?

Mr. Schuber: I can answer that question. The reason you think your temperature in the caustic extraction stage is too high is that you have followed it with a high density hypochlorite and the temperature carries through to the hypochlorite stage. However, we believe the temperature of the caustic stage should not be less than 160°F., because that temperature gives the most efficient extraction. Recently we made quite a study on what we call "partition ratios" between the various fundamental stages, comprising chlorination, caustic extraction and hypochlorite. We used to believe that approximately 70 percent of the total chlorine demand should be used in the chlorination stage. We no longer believe that. Of course pulps in various mills are cooked differently, and have different bleach demands. In fact, two pulps having the same permanganate number do not conform exactly with the bleach demands, and each mill determines its own translation of the permanganate number to chlorine.

If you chlorinate at the rate of 50 percent of the bleach demand and your caustic extraction stage reaches a temperature of 160°, a high-density caustic extraction will permit a considerable saving in steam because of the fact that at low consistency about 32 pounds of water must be heated with every pound of pulp, whereas at high consistency there are only six or seven pounds of water for each pound of pulp.

But going back to your question specifically: If you give it 50 percent instead of 70 percent of the chlorine demand, and the caustic extraction stage is efficient, the pulp should have reached the same permanganate number.

Unfortunately the pulp enters the hypochlorite stage at a high temperature which is not conducive to quality. Does that answer your question?

Mr. McHale: Very good.

Mr. Woodside: I see my friend Malcolm Pineo. Would you care to comment on the question raised?

Mr. Pineo: I am wondering about Mr. Shuber's remarks on chlorination. He said that chlorination above 50 percent has no value. I can't quite understand that.

Mr. Schuber: I mean this: If you take pulps that have the same chlorine demand, and chlorinate to 50, 55, or 60 (we think 50 is the minimum) then after the caustic extraction stage you will have the same permanganate number or the same bleach demand as if you chlorinate that pulp to 70 percent, because at 70 percent

Presented at the Joint Fall Meeting of the Southern and Southeastern Division of the American Pulp & Paper Mill Superintendents Association, at the Atlanta Biltmore Hotel, Atlanta, Georgia, October 21, 22 and 23, 1948.

you do not allow your caustic extraction stage to do all of the work that it could do.

In other words, efficiency of the caustic extraction stage at 70 percent chlorination will be materially less than at 50 percent, because at 70 percent chlorine you have chlorinated certain percentages of your lignin, some of which are water soluble, and the others are only soluble in caustic soda. The order of that solubility is about 60/40, so you wash the water-soluble chlorinated lignin compounds. Consequently, if you only chlorinate to 50 percent, you chlorinate all of the lignin compounds and do not continually chlorinate the already chlorinated compounds, so the saving there, on the chlorine basis, would be in the order of 50 and 70.

Mr. Pineo: But you are assuming the caustic extraction stage follows the chlorination stage.

Mr. Schuber: That is correct. We presume that we consider the sequence of stages in this order as normal: chlorination, caustic extraction, hypochlorite, caustic extraction, hypochlorite and sulfurous acid wash, to give you colors between 80 and 85 G.E. brightness, without injuring the strength of the pulp. And on that basis we made our study on these partition ratios and we have tried it out commercially over a period of many months and find that we do get that saving in chlorine and also get a better pulp.

Mr. Woodside: Mr. Russell, would you care to comment on that question?

Mr. Russell: Would this 50 percent versus 70 percent chlorination, that you say is approximately the same efficiency after the caustic extraction, hold true with a different method of chlorination? Maybe the 50 percent on one chlorination has already solubilized lignin but by having a higher unit concentration of chlorine in the pulp stream with, for example, pipe line chlorination, you can shove the equilibrium further and possibly go to 60 or 70 percent with very little chlorination of already solubilized material, and thus have good chlorine efficiency at a higher level than 50 percent chlorination of the stock in the first stage.

Also, the efficiency of caustic extraction is principally diffusion rate of the material that has been solubilized coming from the fibers into the caustic liquor. The length of time and the temperature would also affect the efficiency of the caustic extraction.

I agree with you that the temperature must be high, but also there must be sufficient time for the diffusion of those solubilized constituents that are put solution due to the alkalinity of the caustic extraction stage. I don't think you can make a blanket statement that 50 percent is the limit and from there on up you are wasting chlorine in the chlorination stage.

Mr. Schuber: That 50 percent should be 50 to 60. My supposition has been based on the sequence of stages which I have given. However, I think your question is related to the fact that you add excess chlorine and then convert the excess to hypochlorite.

Mr. Russell: No, I would never want to do that.

Mr. Schuber: I didn't think you did. But some of our good friends have advocated that sequence of steps.

Mr. Russell: No, I mean that if you have a high unit concentration of chlorine per unit of pulp, such as in a pipe-line chlorination system, you will force the equilibrium towards addition and substitution, rather than oxidation.

Mr. Schuber: Yes, but that efficiency is very low after you reach saturation of the lignin compounds.

Mr. Russell: Yes.

Mr. Schuber: So I think it still follows that there is an opening for a saving of chlorine, by doing more work in the caustic extraction stage. In fact, most mills run their caustic extraction stages at temperatures so low that it is practically worthless.

To answer your question of diffusion rate: As we all know, the chlorination stage is practically 90 percent completed in the first five minutes.

From the Floor: What distention can you use?

Mr. Schuber: We claim that about 60 to 100 minutes is required to consume the last residual chlorine, which is about ten percent.

But, going back to the caustic extraction stages, we find that the time necessary to remove the chlorinated compounds not through diffusion but through mere solubility, is about five to 15 minutes if you have good mixing of the caustic soda through the stock. No matter how well you can wash a chlorinated pulp, even with pulp washers where you get efficiencies of washing between 90 and 96 percent, the first thing you do in the caustic extraction stage is to neutralize the residual hydrochloric acids in the pulp. We generally use about two percent caustic soda of which about one percent is neutralized with the residual hydrochloric acids, and the balance is used for solubilizing the chlorinated materials. We cannot believe that there is a saponification taking place there, but the titration shows a residual active alkali, usually about five percent.

If you use a low density, low consistency caustic extraction, the concentration of the caustic soda is so low that there is very little solubilizing action.

Mr. Woodside: I would like to call on Mr. Noble to make a few comments on the effect of the re-use of water in these various stages on the sort of solubilization they just spoke about. How much water could you possibly re-use effectively without deleteriously affecting the color of the pulp?

Mr. Noble: Well, the question of water always comes up when a bleach plant is installed and we say it takes 60,000 gallons of water per ton of pulp. The answer is, "Where are we going to get that much water?" So we try to cut back to 50,000 or 40,000 gallons per ton. That water is mostly being sent to the sewer from the first two stages, the chlorination and the caustic extraction, because that is where you probably remove 60 to 70 percent of the impurities.

Now then, to make a saving in water, you try to re-use some of the effluent from the chlorination stage. How much of that you can re-use depends on what kind of water it is. If it's good water, perhaps you can use a third back. When you start to use more you may run into trouble by having to use more chemical in the succeeding stage. That's how you tell whether you are in trouble, or not.

There is another answer that is being worked on: that is the use of over-sized washers. When pulp is washed it is diluted to about one percent as it goes to the washer. In a 100 ton mill there will be 1600 G.P.M. going to the No. 1 washer. For 100 tons you use a gallon and one-half per pound, so perhaps 200 G.P.M. goes on top of the washer. That's fresh water that displaces, theoretically, the dirt or impurities in the pulp on the washer. We have tried increasing the 200 G.P.M. to 300 or 400 G.P.M., and cutting down on the dilution

water, thereby saving possibly 500 to 800 gallons of dilution water that is only used as a conveyor to get your pulp to the washer at a low enough density so you can handle it on the washer.

On a recent installation we increased the size of the washers by 50 percent. We are adding the extra 200 G.P.M. on those washers and have succeeded in cutting down the total volume of water consumed to around 20,000 gallons per ton.

We will have some more data in a few months when this mill gets up to full production.

The same thing applies to the water from the caustic stage. You must feel your way along and use as much as possible without getting into trouble. The trouble is indicated by not getting your final result, or having to use more chemical.

I should have said that in a multi-stage system you start your fresh water on the tail end and keep re-using as much of that water as you can for dilution, all the way back through, and send it from the chlorination and caustic extraction stages to the sewer; and of course you never use anything except fresh water on the washers.

Mr. Schuber: One of the best and most practical indications as to the efficiency of the caustic extraction stage is the color of the effluent. If the caustic extraction stage is doing its work efficiently the color of that effluent should look practically like black liquor. It should be black. If it is brown, or light brown, then you are not doing any work in the caustic extraction stage and you might as well skip it.

From the Floor: What is the minimum temperature?

Mr. Schuber: Nothing under 160°F. Otherwise the efficiency of your caustic extraction will be very low and the total chlorine demand will be high, and you are practically wasting all of the excess chemical in your caustic extraction stage.

If you cannot afford to raise or elevate that temperature to 160°F., you should, from an economic standpoint, then just use a neutralization stage. Just neutralize the excess acidity that comes off your washer and go to the hypochlorite stage where you pay the penalty of increased chlorine demands, as well as deleteriously affecting your pulp quality.

Mr. Staidl: I want to change the subject a little. As you know, there is a lot of interest of bleaching semi-chemical pulp and I want to throw this into the fire. If you produced a semi-chemical pulp that would give you a fairly high yield of 70, 75 percent pulp, on the heavier woods, would you use the standard procedure of bleaching, chlorination, and so forth, to obtain a brightness of 85 on this pulp? Would you use a single chlorination or double chlorination and how much water would you use?

Mr. Schuber: Here you have an entirely different type of pulp. The lignin content of the Southern hardwoods usually runs in the order of 26 percent. After the pulp is blown and de-fibered through modern attrition mills, you have a pulp that has a lignin content around 15 percent.

The purpose of the neutral sulphite semi-chemical pulp is to retain in the pulp all of the hemicellulose, all of the sugars and as much strength as possible. The unbleached pulp will have a strength comparable to kraft gum pulp.

Fortunately, and to our amazement, when we first tried it we found that on bleaching a neutral sulphite semi-chemical pulp we have an increase in strength of somewhere around 50 percent.

The reasons are that in the neutral sulphite semi-chemical process we still use the three fundamental bleaching stages of chlorination, caustic extraction and hypochlorite and in the chlorination stage we want to chlorinate the lignin particle. In the hypochlorite stage we want to bring it up to color and oxidize the colored bodies to white, colorless material. The acidity of the neutral sulphite semi-chemical pulp for chlorine is tremendous, and although the solubility of chlorine in water is only in the order of six to seven grams per liter, at low temperatures of fresh water, you can put as high as 22 or 23 percent chlorine in the chlorination stage.

Now, after that takes place, some mills cook down to ten or 12 percent lignin. If we could remove all of the lignin from the pulp in the neutral sulphite semi-chemical process, then we would really have a pulp that would compete in paper making with Southern pine kraft, except for tear.

Retrogressing a bit, we come back to the caustic extraction stage. In order to retain our big yields there we don't go over 110°F. And it doesn't matter whether you use high density or low density, because there is merely a question of neutralizing the hydrochloric acid and getting as much of the chlorinated lignin compounds that are soluble in caustic into solution. Our efficiency there is low. And the reason we don't use high densities and high temperatures is due to the fact that the amount of caustic soda necessary to neutralize the hydrochloric acid is about 50 percent of what we put in there.

However, if we put in the regular two percent caustic soda there, then we have a very marked tendency to dissolve the pentosans, which are very high, in the order of 22, 23 percent. This would obviate the purpose of the whole neutral sulphite semi-chemical process because it's these carbohydrates which hydrate so readily.

Mr. McEwen: I haven't a direct answer to your particular question on high brightness levels on semi-chemicals, but with peroxides we have done some work, taking the neutral sulphite semi-chemical from the mid-fifties up to 70, 72, 74, single stage peroxide, medium consistency, in two or three hours. The main advantage is that your yield is about 96, 98 percent of the unbleached pulp. That's a lower brightness range than you were referring to.

From the Floor: Is that a permanent brightness?

Mr. McEwen: It is not too fast to a light agent, but it is permanent to dark storage.

From the Floor: In other words, you would advocate, to get a 75 brightness, the use of peroxide and the elimination of all other bleaching, chlorination, etc.

Mr. McEwen: I don't know all the facts and figures of the chlorination and caustic extraction method, but it seems to me that the single stage peroxide system does have some merit and it particularly revolves around the fact that you can get to the high 60's and low 70's brightness range with very high yields.

Mr. Russell: I think, first of all, that this peroxide method is practically just what we need, because semi-chemical is about half-way between ground wood and full chemical cook, and the peroxide bleaching system doesn't decrease the yield. We still have the same amount of lignin we started out with, and have merely bleached

the lignin as well as the fiber. It has the inherent disadvantages of that high lignin content but if it is suitable for the particular paper you are making, then that's the thing to use.

It is perfectly reasonable to expect an increase in strength because you have a stiff, highly lignified fiber that you are purifying in such a way with chlorine that you don't degrade the cellulose. With chlorine dioxide and with chlorous acid, we do take lignin out so that we can't give the 96 or 98 percent yield. We do take some pentosans out, as hypochlorite and caustics do, though we still maintain a high pentosan content.

Making an 85 brightness, semi-chemical pulp, while still maintaining the high yield of, say 70 percent, is a neat trick. I agree 100 percent that there is no point of doing anything but really neutralizing in the caustic stage, so that you get as much of the chlorinated lignin out as possible at just above neutrality. And then the consideration of getting up to 85 brightness should include a possible use of chlorine dioxide with hypochlorite in order to decrease the attack on the pentosans, and also maintain the strength and hydrating characteristics that you are trying to get with semi-chemical pulps.

Mr. Schuber: I would like to expand a little bit upon Mr. Russell's statement. In the 3-stage bleaching of neutral sulphite semi-chemical pulp, the partition ratios are entirely different than with normally-cooked pulps. In the first place this pulp requires 15 percent chlorine and we have been bleaching with 90, 95 percent of the total chlorine in the chlorination stage. That is at variance with the other statements I have made regarding partition ratios in bleaching kraft pulp. The reason for that high chlorine demand is the fact we must chlorinate the lignin which we want to get rid of. And the only reason we cook it that way is to soften up this lignin bond with the cellulose, which enables us subsequently to make pulp out of it and de-fiber it in the attrition mills. We use 90 to 95 percent of the total chlorine in the chlorination stage, and we know that under the conditions of chlorination that does not affect the pentosan content. Then, in the hypochlorite stage, we only use about one percent hypochlorite and that immediately flashes the pulp to an 85 brightness. With an economical set-up of equipment I don't think that you can attain these results with chlorine dioxide due to the materially lengthened time that it will take to do the bleaching. Further, I would like to ask if, with peroxide, do you get a material increase in strength?

Mr. McEwen: We don't get anywhere near the strength increase that you are talking about, not in a single stage.

Mr. Moore: What I want to know is, do you get the yield?

Mr. Schuber: The yield, Mr. Moore, is predicated on the type wood used. The oaks give about the lowest yields of all woods we have tried. The oaks are very dense and contain tannic acids. Also they do not have the total cellulose content that the other hard woods have. We get, on the basis of wood, about 57 to 60 percent yield. If we start with one hundred pounds of oven-dried wood, we get 57 to 60 pounds of bleached pulp having a brightness of 85 to 88. With the gums we have had yields as high as 65 to 70 percent.

Mr. Russell: For any of you who are getting a flash up to 85 brightness with hypochlorite, we would not recommend the use of chlorine dioxide. If you do not get this flash up to 85 brightness and get strength degradation, then we believe that is a place for chlorine dioxide.

Mr. Staidl: I have listened to all this dissertation. Am I right in assuming you could make semi-chemical pulp and use an ordinary 3-stage bleaching system to get an 85 percent whiteness with, say, about a 60 percent final yield of pulp from your original wood?

Mr. Schuber: Absolutely. There isn't any question of doubt about that.

Mr. Staidl: Using chlorine dioxide, how would this fit in? Give the chlorinated pulp just enough caustic treatment to neutralize the chlorinated products, wash, and then use chlorine dioxide? Could you get an 85 brightness white that wouldn't revert? With a modified process is there any possibility that you would get a simple bleaching operation, that wouldn't require too much water, with an end product that would be permanent and give all the characteristics that we have in mind?

Mr. Russell: Definitely yes, because the reversion of pulp color is really due to the presence of residual lignin, its oxidation products and, degraded cellulosic materials. The use of chlorine dioxide, with or without chlorine, is a laboratory method for producing the whole cellulose and, it will not oxidize cellulose. So that you are hitting the thing from both angles for producing the highest brightness with minimum strength loss and minimum reversion of color, by that process. However, I do not know if it is possible to use all species of wood with semi-chemical pulping and 3-stage bleaching to produce pulp with 85 brightness. Maybe Mr. Schuber can tell us.

Mr. Schuber: Yes. Regardless of the wood. All of the hard woods lend themselves very admirably to the process. Further, I would like to expand on what Mr. Russell said about chlorine dioxide. It is a classical method of removing the lignin from wood. There has been considerable research on that and a very wonderful job has been done. They have even taken the wood and pulped it with chlorine dioxide. Is that right?

Mr. Russell: That's right. It's quite a pulp.

Mr. Schuber: Unfortunately, the cost at present is tremendous but I understand that they expect to be able to reduce the price of chlorine dioxide in the future. I would like to say a few words about the mechanism of chlorine dioxide as applied to sodium hypochlorite.

This reversion of color is due to what Mr. Russell has told you but it is also due to the use of calcium hypochlorite. I think most of the mills in the South have now gone to the use of sodium hypochlorite. The oxidation potential of chlorine dioxide is so low and cellulose is such a very inert material under certain conditions, that there is no reaction between the cellulose and chlorine dioxide but the latter does have the power to oxidize and combine with the more active materials such as lignin and other colored bodies. Therefore, it is unquestionably the best bleaching agent we know of, and I believe that in the years to come all of you people that are bleaching now will use it in one place or another.

The oxidation potential of chlorine dioxide at pH7 is in the order of .85 or .75; I have forgotten the technical factor there, but it is unimportant. As you proceed on the alkaline side the oxidation potential decreases. The hypochlorites have a much higher oxidation potential than chlorine dioxide and that's why you have to be so very careful in their use.

Although calcium hypochlorite and sodium hypochlorite have similar oxidation potentials, we cannot control very well the pH value of calcium bleaches for the simple reason that the solubility of calcium hydroxide is very limited. On the other hand, sodium hypochlorite and caustic soda are very soluble. Although the hypochlorite oxidation potentials start at a higher level; say in the order of one volt that curve drops down where at a pH of seven you have the same oxidation potential that you have with chlorine dioxide at a pH of seven. Consequently, we have adjusted our pH values in the hypochlorite stages to a pH of seven and we find that the cuprammonium viscosity of the pulp can be retained at the same level as pulp bleached with chlorine dioxide at a pH of seven.

Mr. Woodside: Mr. Schuber, I would like to interject, here, a minute. I see in the audience Dr. Vincent, who was the daddy of sodium chlorite and sodium dioxide. He probably has more patents on their manufacture and use than any living man. I wonder if he would like to comment on anything that has been said here?

Dr. Vincent: Mr. Woodside, this is an unexpected compliment, though a little bit illegitimate.

Certainly everything Mr. Schuber has said is very clear. I would like to suggest to Mr. Russell and Mr. Schuber that we go back a minute to what was said originally: That after you make a semi-chemical pulp and chlorinate it, you can with peroxide or hypochlorite, bring it up to an 80 or 85 brightness.

Mr. Schuber: No; Mr. McEwen didn't say you could bring it up to an 85 color with peroxide in a single stage. He said 60 or 65.

Mr. McEwen: Without chlorination.

Mr. Schuber: That's a single stage hydrogen peroxide.

Dr. Vincent: But after the chlorination stage, you could bring it up to 85 with hypochlorite without any great degradation.

Mr. Schuber: That's right.

Dr. Vincent: Is there a possibility that in that flash you don't degrade it because you have a balance between increasing it and degrading it; you come out just about where you started, whereas if you used chlorine dioxide —(interruption)

Mr. Schuber: Maybe instead of getting a 50 percent increase in strength you would get 100 percent increase in strength.

Dr. Vincent: That is what I was thinking of.

Mr. Schuber: I will say no, for the reason that the pentosan content, which we believe gives you this increase in strength after you remove the inert lignin compounds, is about the same as it was in the unbleached pulp. Actually the percentage of pentosans is higher but this is due to a lower overall yield, from the removal of lignin. Does that answer your question?

Dr. Vincent: In regard to the pH control of hypochlorite when bleaching, you naturally want to get a whiter color and you don't want to degrade the pulp. The oxidation potential is one thing and kinetic energy is another. It won't hurt the pulp and it will also bleach. I presume that when you control the pH of hypochlorite to the right point in semi-chemical process maybe you will get the same color over the same length of time. I offer it as a question on this basis: We find, in the business of killing germs, etc., in a water system, that on the acid side chlorine dioxide isn't worth much more than chlorine as a disinfectant material, but over pH seven, on the alkaline side, we can kill any normally-occurring organisms, even some of the viruses, with no decrease of speed. Using chlorine dioxide we can kill some of those bugs in a fifth of the time required with hypochlorite having the same available chlorine. Thus, whereas the potentials may be the same, the kinetic energy is very, very different.

Mr. Schuber: I think that is a very important question. What you say is absolutely true. The kinetic energy in the bleaching reaction is a function of the temperature. As we all know, for every 18°F. rise in temperature we approximately double the rate of reaction. In other words, if it takes us 60 minutes at 100°F., at 118°F. it will take us half that time. So again, we find that at those higher pH values, using sodium hypochlorite, we can increase and push the kinetic energy phase by raising the temperature 18° while still holding the same oxidation potential, because the oxidation potential with hypochlorites does not seem to be a function of the temperature. It is parallel to the base. But it does increase the rate of reaction and we get the same results with a minimum of time. Does that follow your thought?

Mr. Woodside: Gentlemen, this has been very interesting. We could go on for hours and hours and get more involved and hotter and hotter and blow the roof off, perhaps, but there are other persons with papers to give and I don't want to encroach upon more of their time than necessary.

Are there any questions from the floor to which we might give a quick answer? Anybody have anything they would like to bring up at this time? Well, if not, I want to thank everyone that served on this and turn the meeting to our chairman. (Round Table Discussion concluded.)

Deinking Waste Papers With Sodium Peroxide

By J. H. HEUER

Technical Director, St. Regis Paper Co., New York City

Recent trends in the pulp and paper industry have led to a need for improved techniques in the recovery of used papers.

The waste paper industry has expanded tremendously in the past few years, mainly because waste paper is cheaper than virgin pulp and more available. The utilization of waste paper must always be considered from the point of view of its cost compared to the cost of virgin pulp.

Groundwood is being more generally recognized as a desirable raw material for the manufacture of papers to be used in magazines and catalogues, which normally comprise the bulk of the raw materials

Presented before a meeting of the Michigan Division of The American Pulp & Paper Mill Superintendents Association, Inc., on October 21, 1948, at Hotel Harris, Kalamazoo, Michigan.

used in deinking plants.

Conventional recovery processes for waste papers that are essentially free from groundwood have demonstrated shortcomings when applied to waste papers with substantial groundwood content. Consequently, as increasing quantities of groundwood enter into paper manufacture, new problems arise in connection with the deinking and bleaching operations in recovery processes.

There are many diversified deinking processes and equipment on the market today. It seems to be the goal of every plant that utilizes waste paper to always be trying something new whether it is machinery or some new chemical for deinking.

This procedure is understandable since a number of deinking plants are not producing good quality pulp for incorporating into their paper furnish.

Briefly the conventional recovery processes consist of deinking with caustic soda, soda ash, or other alkaline chemicals, utilizing high temperatures and long cooking periods.

It was due to the degradation and darkening effect that these alkalis had on groundwood and to the acute shortage of a great number of these alkalis during the war that led a number of companies to carry out an investigational program which led to the development of an improved process for deinking papers containing large amounts of groundwood.

It is the general consensus that to obtain satisfactory deinking, mechanical action plus chemical action and heat are required.

Mechanical action defibers the paper. Chemical action puts the ink vehicle in a form in which it can be more readily removed. This could be saponification, selective wetting or emulsification. Heat speeds up the mechanical and chemical action.

Assuming these statements are basic truths, there must be an optimum ratio between them for any given set of conditions.

The sodium peroxide process for deinking recovered papers includes the following operations: The waste papers, after treatment in a hydrapulper or some other type of defibering equipment with a solution containing an alkali and sodium peroxide, are subjected to a mild cook.

Better utilization of waste papers has resulted from the introduction of sodium peroxide into the deinking operation. This favorable influence of sodium peroxide is considered due to its ability to modify and disperse the various ink vehicles as well as starches, glues and other organic components encountered in waste papers.

Sodium peroxide is an alkaline peroxide bleaching agent, containing 20 percent active oxygen. The peroxide persists to the end of the cooking step, in concentrations sufficient to inhibit the color reversion that groundwood undergoes when subjected to hot, alkaline treatment.

The economic and technical advantages derived from operating the sodium peroxide deinking process over the past year are summarized briefly as follows: *It is practical to utilize a lower grade of waste papers and yet meet the standards of paper quality. It has been possible to increase the amount of magazine stock from 50 to 75 percent and reduce the amount of ledger stock from 50 to 25 percent.*

Using sodium peroxide in the deinking operation results in an increase in the overall *chemical costs*. However, the other advantages of "sodium peroxide" in the deinking operation more than compensate for this increase in chemical costs.

The amount of chemicals used for operating the sodium peroxide deinking process is approximately one-third that of the requirements for satisfactory results in the alkali deinking process. This decrease in chemical requirement is due to two factors: (1) Satisfactory deinking results are obtained in the "sodium peroxide" process with less alkali than is required in the alkali process; (2) Steam costs due to reduction of cooking temperature together with a decrease in cooking time have effected a substantial saving in the use of high pressure steam.

A reduction in labor costs at the Kalamazoo mill of the St. Regis Paper Co. was made possible by eliminating belt-sorting of waste paper.

Higher pulp yields have been obtained. This is attributed to less fiber degradation under milder cooking conditions and lower temperatures encountered in the peroxide deinking process.

Increase in production capacity is obtainable from existing equipment in the deinking mill due to the shorter time schedules for defibering and cooking. This is necessarily dependent upon adequate screening and washing facilities.

One of the most important results from the sodium peroxide process has been the leveling influence and greater uniformity in the brightness of pulp obtained after the sodium hypochlorite bleaching operation. In addition to better uniformity the brightness level has been raised appreciably.

Literature

Department of Scientific & Industrial Research, Park House, 24 Rutland Gate, London, S.W. 7, England. Book, "Treatment and Disposal of Industrial Waste Waters," price $3.65 U.S.A. Describes the various methods of treatment tried in each industry, giving summary of the results in a series of tables.

B. F. Goodrich Co., Akron, Ohio. Catalog section, "Multicord Multi-V Belts". Pictures and describes construction of Multi-V Belts, including Grommet V-belt. Gives belt numbers, sizes and pitch lengths, also suggests procedure for designing drives using Multi-V belts.

Homestead Valve Mfg. Co., Inc., Coraopolis, Pa. Bulletin, "Homestead-Reiser Self-Seal Lubricated Plug Valves", Section 5 of Valve Reference Book, No. 39. Offers general catalog data, descriptions, specifications and prices on the units, parts and accessories.

Dow Corning Corp., Midland, Mich. Booklet, "DC 200 Silicone Fluids, Dow Corning Silicone Notebook, Fluid Series No. 3". Provides a comprehensive body of information on the properties and behavior of DC 200 Silicone Fluids.

Downington Mfg. Co., Downingtown, Pa. Catalog, No. 848, "Downingtown-Wiener Stock Regulating Valves."

Goulds Pumps, Inc., Seneca Falls, N. Y. Bulletin 630-A1, "Goulds Industri-Jet Pumps".

Trends

Office of the PAPER TRADE JOURNAL, Wednesday, December 8, 1948.

Wood Pulp

Conditions can shift so rapidly during any period of economic adjustment that be one ever so right when he goes to press, he is likely to find his judgment scrambled before the story reaches its readers. The "incipient buyers' market" referred to in the Department of Commerce's November market review has developed; the "current surplus of market pulp over mill requirements" has softened prices on domestic pulp; and paper mill inventories are considered *uncomfortably* high. Competitive prices are reported on grades which had been in short supply, further price and freight adjustments are announced, spot offers become numerous, buying is at a minimum.

The close of the year and inventory position are considered the determining factors in the majority of these adjustments. Return of normal peacetime paper demand also is seen as effecting some change in pulp prices, despite rising costs of production. No general decline is seen as likely in pulp and paper prices.

Canadian groundwood is reported on the Boston market at $75 for quick or 1949 shipment with maximum freight allowance. Southern kraft in the same market is reported at $112 delivered with maximum freight allowance of about $10.

Effect of the softened domestic market on Scandinavian trading cannot be known at once. Announcement of Finnish first quarter prices is expected about December 15. Notice of Swedish prices can be deferred until open water, about March 15. Problems of internal finance face both countries.

Finland

A favorable return was recorded on the money market during the summer, states the Bank of Finland's Monthly Bulletin; "and there are signs indicating that the change may not be only temporary. Yet the threat to the mark is still there, and the money market will apparently not become quite normal until the money is stabilized. Prices have continued to be fairly stable. They tend to rise, but only slowly, some even being slightly reduced. The cost of living index (August 1938-July 1939=100) has risen from 720 points in December 1947 to 816 in August or by 13 percent, as against 30 percent in the same period of last year. The price of fuel, light and clothing and taxes have risen most, while that of food has fallen slightly, mostly owing to imports of cheap consumers goods. The wholesale price index (1935=100) has on the whole moved in the same way as the cost of living index. In January-July, the general index for home market goods rose by 11.3 percent or slightly less than the cost of living. In July, it was 1,124 but dropped to 1,118 in August. The special index on which wages are based (October 1947=100) was 114 in February, dropped to 111 in May and was again 112 in August. This was very important for the monetary policy as no general increase of wages has been necessary in the summer or autumn; they will be raised as soon as the index rises to 115. The recent calm in respect of labor and wages, the distinct improvement in supplies, and some other favorable factors have rendered the monetary conditions very much more stable than for a long time past. Nevertheless, the danger of an increase in the inflation is not yet avoided."

Also reported by the U. S. Department of Commerce is an agreement for exchange of goods between Finland and the Soviet Zone of Occupation in Germany during the year which began October 1, 1948, signed in Berlin on September 29, 1948. "The agreement provides for trade, during the year of its validity, having a value of approximately $6,500,000 on each side. Finland is expected to export to the Soviet Zone of Germany wood pulp, paper and iron pyrites. It is planned that exports from the Soviet Zone of occupation in Germany will be potash, fertilizers, machines, electrical equipment, chemicals, textiles and optical and precision instruments.

Waste Paper

Prices of all grades of waste paper took a further drop with the softening wood pulp market, with high grades showing deepest cuts. This market, commonly described as "Feast or Famine," is glutted, particularly with *mixed* paper. Status of *folded news* is reported to be somewhat above that of *mixed* but not encouraging.

"Waste paper consumption in the Eastern mills during the last quarter of this year is running along on about the same basis as during the corresponding period of 1946, and something like 8 percent behind the similar weeks of last year. While production of paper, paperboard and other paper products continues high, and possibly may exceed last year's all-time record, the reduction in the amount of waste paper consumed has been due to an easing of the pulp situation in recent months and a greater amount of pulp being used than heretofore," reports Director Colley S. Baker of E.C.C.

"Greatest drop has been in the amount of the mixed grades of waste paper. As a matter of fact, virtually all of the decrease has been in the mixed grades. News, container and high grades have held up well throughout this year, and, despite the fact that more mixed grades are available for collection than ever before, there has been less demand for them from the mills. This does not mean, by any means, that the consuming mills are not using mixed waste paper in substantial amounts. For instance, the board mills this year have consumed about one-third of their total amount of waste paper in the mixed grades, but in 1946 they consumed about 41 percent in mixed.

"Dealers, who have been large producers of the mixed grades, especially in the metropolitan centers, are somewhat concerned with the present situation. Their collection and trucking costs have substantially increased during recent months, and many, especially those with contracts with large office buildings and department stores, claim that they have had to suffer losses. Eastern waste paper dealers have done a first rate job this year, and are to be commended especially for the improvement in the quality of the pack offered the mills. With signs of bad weather beginning, it may be expected that there will be some inventory buying between now and Christmas week. In all likelihood the news grades will predominate in such mill purchases.

"Mill purchases last week included some inventory buying, when news receipts exceeded consumption by several hundred tons. For the first 47 weeks of this year, collections have exceeded those of the comparable period in 1946 by 8.6 percent, but are 2.8 percent below those of last year. Consumption so far this year has been 9.9 percent above the first 47 weeks of 1946, but 1.9 percent below last year."

Cottons

New cuttings also show some softening of price. Position of old rags is unaltered. Trading is quiet, prices nominal. *Foreigns* are reported as nominal with little arriving.

Indexes

Index of general business activity for the week ended November 27 dropped to 151.7 from 156.8 in the preceding week, compared with 150.8 in the corresponding week of 1947.

Index of paperboard production rose to 209.4 from 198.0 in the preceding week, compared with 194.4 in the corresponding week of 1947.

Comparative ratios of U. S. paper and paperboard production to mill capacity, as reported by AP&PA are:

	Nov. 27 1948	Nov. 20 1948	Nov. 29 1947	Nov. 30 1946	Dec. 1 1945
Paper**	94.0	‡99.4	107.4	103.0	97.5
Paperboard ..	89.0	97.0	100.0	94.0	96.0

** Indicates 1948 volume of 169,313 tons. Comparable week, 1947, 170,211 tons. ‡ Revised.

Paperboard Production (Tons)

	Nov. 27 1948	Nov. 20 1948	Month of Nov.
Production	183,311	195,552	758,908
New Orders	150,890	174,440	737,016
Unfilled Orders	338,720	373,804	338,720

Percent of Activity, Current 89%; Year 96%.

Imports

Week Ending Dec. 4

NEW YORK

Newsprint

N. Y. Post Corp., Kim, Rouen, 180 rolls.
Bulkley Dunton Paper Co., Kim, Rouen, 4 rolls.
R. A. Olsen, Kermic, Donnacona, 379 rolls.
R. A. Olsen, Newscarrier, Donnacona, 384 rolls.

Drawing Paper

H. Reeve Angel & Co., Inc., Port Darwin, London, 1 cs.
H. Reeve Angel & Co., Inc., American Importer, London, 2 cs.

Filter Paper

H. Reeve Angel & Co., Inc., Port Darwin, London, 14 cs.
H. Reeve Angel & Co., Inc., American Importer, London, 17 cs.

Transparent Paper

M. J. Corbett Co., Arendsdyk, Rotterdam, 1 cs.

Paperhangings

W. H. S. Lloyd & Co., American Importer, London, 16 bls., 7 cs.
C. A. Haynes & Co., American Importer, London, 31 bls.

Photo Paper

American Express Co., American Importer, London, 147 drums.

Wallpaper

Hudson Shipping Co., American Importer, London, 4 cs.

Glass Paper

Frank Allaire, Inc., American Importer, London, 1 cs.

Rice Paper

Ho Chong Co., Triton, Hong Kong, 10 cs.

Strawboard

Premier Decorations Inc., Raphael Semmes, Antwerp, 7 bls.

Miscellaneous Paper

Manufacturers Trust Co., Gripsholm, Gothenburg, 1009 rolls.
Parsons & Whittemore, Inc., Gripsholm, Gothenburg, 1 roll.
Lansen Naeve Corp., Washington, Havre, 12 cs.
G. A. Vedovi, Meridian Victory, Genoa, 1 cs.

Rags, Baggings, Etc.

(———), Port Darwin, London, 56 bls. paperstock.
Crane Co., Port Darwin, London, 27 bls. linen thread, waste.
(———), Port Darwin, London, 56 bls. old strings.
H. Adlerstein, Hoegh Silverbeam, Genoa, 45 bls. old jute rags.
(———), Hoegh Silverbeam, Genoa, 90 bls. light hessian bagging.
New England Waste Co., Minute Man, Recife, 735 bls. cotton waste.
Midwest Waste Material Co., Gudrun Maersk, Antwerp, 277 bls. scrap bagging.
Irving Trust Co., Gudrun Maersk, Antwerp, 81 bls. old waste bagging.
A. W. Fenton, Inc., Gudrun Maersk, Antwerp, 65 bls. scrap bagging.
J. H. Schroeder Banking Corp., Vinkt, Antwerp, 228 bls. cotton waste.
H. Adlerstein, Meridian Victory, Antwerp, 67 bls. old jute rags.
E. J. Keller Co., Inc., American Miller, Havre, 66 bls. rags.
A. de Vries Trading Corp., American Miller, Havre, 122 bls. rags.

Gluestock

National City Bank, Minute Man, Recife, 53 bls. (dry).
John Gorvers, Cape Avinof, Barranquilla, 184 rolls.
Trans-Atlantic Animal ByProducts Inc., Coracero, Buenos Aires, 54 bls.
H. Remis, Cape Ann, Barranquilla, 220 rolls.

Casein

American British Chemical Supplies, Inc., Uruguay, Buenos Aires, 600 bags (lactic).

BOSTON

Hercules Powder Co., Coracero, Buenos Aires, 800 bags lactic casein.

PHILADELPHIA

Castle & Overton, Inc., Meridian Victory, Alexandria, 76 bls. old cotton rags.

Export Outlook Darkened

WASHINGTON—The immediate outlook for increased United States exports of pulp and paper is darkened by dollar exchange shortages in the importing countries, the Department of Commerce reports currently.

Several countries have placed embargoes on importation of various types of paper and paper products, and many others are exercising strict control through quotas, import licensing and exchange authorizations, the Department continued.

"It is not expected moreover," said the Department, "that allotment of ECA funds will affect direct United States exports of pulp or paper to any great extent, since these funds will be used principally for rehabilitation of industry and purchase of foodstuffs." Preliminary figures for the first six months of 1948 show that exports of paper base stocks, paper and related products amounted to 337,640 tons valued at about $75,000,000, the department recalled. These figures are nine percent and 11 percent respectively under corresponding figures for the first half of 1947, with the decrease attributed primarily to shortages of dollar exchange in importing countries, rather than to any decrease in world demand.

Canadian Car Loadings

OTTAWA—Car loadings on the Canadian railways from the first week of this year until the week ending November 20 rose to a cumulative total of 200,120 cars of woodpulp and paper compared with 195,898 cars in the similar period a year ago ending week of November 22, according to the latest nation-wide survey by the Canadian Government. In the Eastern Division, such car loadings advanced to 173,186 cars as against 168,516 a year ago, and, in the Western Division, rose to 26,934 cars compared with 25,382 cars last year.

Tax Huddle, Feb. 24

BRAMPTON, Ont.—The position of the Canadian Weekly Newspapers' Ass'n., on the eight percent sales tax on newsprint will be decided at a meeting of the CWNA's director in Ottawa on February 24, W. E. McCartney, managing director, said this week.

On November 22 the Association asked Finance Minister Abbott to remove the tax and thus put them on an even footing with competing publications.

In its brief the CDNA pointed out the tax does not apply to paper used by Canadian magazines, American magazines sold in Canada, comic books, pulp fiction magazines, or the *Toronto Star* weekly, which has assured the government it is not a newspaper. It does apply to daily and weekly newspapers in general and to week-end papers carrying news sections.

Plan Pulp Parley

OTTAWA — A conference of pulp-producing countries to be held under the United Nations Food and Agricultural Organization is to be sponsored by the Canadian government, Resources Minister J. A. MacKinnon disclosed on November 29.

The conference will be held in Montreal next March and delegates from 19 countries and observers from others are expected to attend.

A study of conservation policies and future markets prospects will probably be uppermost in discussions.

Digby Shipping Pulp Wood

DIGBY, N.S.—Loading of 2,000 cords of pulpwood aboard the Danish steamer Bette Mearsk was completed on November 25. The pulpwood is destined for Holland. It is the third cargo shipped from here under the Marshall Plan.

Max M. Nafthal, lumber shipper, stated the same day that four more ships to carry pulpwood were expected shortly.

Shipments of pulpwood will begin again in May, he stated, and some six to eight steamers are expected.

Export Restrictions Eased

WASHINGTON—Fixed quota limits on exports of caustic soda were removed in an action by the Office of International Trade on December 2. However, validated licenses must still be obtain by caustic soda exporters, it was pointed out.

The modification in export restrictions, it was said, is due to a general improvement in the world supply, although domestic stocks are still in such inadequate supply that it must remain on the so-called "Positive List" which involves licensing, in order to protect domestic users.

Newsprint Exports Shrivel

OTTAWA — Canadian shipments of newsprint to Australia this year are running almost 80 percent below the exports of the preceding year, when 161,592 tons of newsprint were sent there from Canada.

NEW FREE HANDBOOK

Your Copy is Ready

ADDRESS: 270 Madison Avenue, NEW YORK 16; 3641 So. Washtenaw Ave., CHICAGO 32; 735 Battery Street, SAN FRANCISCO 11; and other principal cities. IN CANADA: Meredith, Simmons & Co., Ltd., Toronto. IN ENGLAND: National Adhesives, Ltd., Slough.

EVERY TYPE OF ADHESIVE FOR EVERY INDUSTRIAL USE

Prices

Quotations indicate trends in an open market. At the moment they can be of little more value. While some volume business still is done under contract at the figures shown, fluctuations are too varied and frequent to permit prices to be interpreted as representing a wholly stabilized market.

NEW YORK

Paper

(Delivered New York)

Standard News, per ton—
Rolls, contract ..... $100.00/ —
Sheets ..... 115.00/ —

Kraft—per cwt.—Carload Quantities Zone A
Deld. 40 lb. base wgt.
Superstandard Wrapping ..... $9.00/ —
No. 1 Wrapping 7.75/ 8.00
Standard Wrapping Rolls ..... 7.00/ —
Standard Wrapping Sheets ..... 7.50/ —
Standard Bag ..... 6.50/ —

Tissues—Per Ream 24x36 (480) 10/11 lbs. Zone 1.
Wh. No. 1 Frd. ..... $1.84/$2.00
Wh. No. 1 M. G. 1.94/ 2.00
Wh. No. 1½ ..... 1.65/ —
Wh. No. 2 ..... 1.50/ 1.70
Kraft Anti-Tar ..... 1.65/ —
Kraft Unbl. ..... 1.85/ —
Shred. Wh. No. 1 per lb. ..... .12¾/ .18

Toilet—Per Case of 100 rolls—1 M Sheets.
Unbleached ..... $7.50/$10.00
Bleached 8.75/ 10.00

Paper Towels—Per Case of 3750—Zone 1.
Wh. Jr. M'tif'd 9¼x9¼ $5.45
Br. Sr. M'tif'd 10x12 ..... 3.80
Br. Jr. M'tif'd 9½x9¾ 3.30
Br. Jr. Sgl. fold 10x10¾ 3.35

Manila—per cwt.—C-1 f.a.
No. 1 Jute Tag ..... $14.50/ —
Reg. Jute Manila ..... 13.25/$15.50
No. 1 Manila Wrapping 8.75/ 10.50
5 lb. Manila 10.75/ 11.25

Boards, per ton—
Filled News 94.00/
Plain Chip 85.00/ 90.00
Blchd. Mla. L-d. Chip* 105.00/
White Pat. coated* 120.00/
Kraft Liners 42 lb. 105.00/
Kraft Corr. .009 ..... 110.00/
Binders Boards 120.00/126.00
* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—
White, 16 lb.
Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$59.00	$54.55	$52.30
100% Rag	52.25	48.30	46.30
75% Rag	41.50	38.30	36.70
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Ledgers, per cwt.

100% Rag Ext. No. 1	$57.00	$52.65	$50.50
100% Rag	50.25	46.40	44.50
75% Rag	41.50	38.30	36.70
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Sulphite Bonds and Ledgers—
White, 16 lbs.
Bonds, per cwt.

No. 1	$21.25	$19.25	$18.50
No. 2	20.25	18.30	17.55
No. 4	19.25	17.55	16.85

Ledgers, per cwt.

No. 1	$21.75	$19.65	$18.85
No. 2	20.75	18.75	18.05
No. 4	20.00	18.10	17.35

White Book, per cwt.—
Coated

	Case	Ton
No. 1 Glossy	$20.90	$20.15
No. 2 Glossy	19.65	18.90
No. 3 Glossy	18.90	18.25
Machine Coated	16.65 to 17.15	16.05 to 16.35

Uncoated

No. 1 Antique (Watermarked)	16.40	15.80
Offset	15.15 to 17.15	14.60 to 16.40
A Grade E. F.	15.40	14.85
A Grade S. C.	15.90	15.35
B Grade E. F.	15.15	14.55
B Grade S. C.	15.65	14.95

New Domestic Cotton Cuttings

(Prices to Mill, F.o.b. Ship. Pt.)

White Shirt	$10.00/ $10.50
Unbleached Muslin	10.50/ 11.00
Light Silesias	7.75/ 8.00
White Back Blue Overalls	6.25/ 6.75
Blue Overalls	6.00/ 6.50
Fancy Shirt	5.00/ 5.50
Percales	6.25/ 6.50
Light Prints	6.50/ 6.75
No. 1 Washables	4.00/ 4.50
Bleachable Khaki	5.50/ 5.75
Unbleachable Khaki	5.00/ 5.50
Cottonades	4.75/ 5.25
Lt. Flannelettes	7.50/ 8.00
Men's Corduroy	4.25/ 4.50
Women's Corduroy	4.00/ 4.25

Old Domestic Cotton Rags

(Prices to Mill, F.o.b. Ship. Pt.)

	Per 100 lbs.
No. 1 Whites, Repacked	$5.00/ $5.50
No. 1 Whites, Miscellaneous	4.00/ 4.50
No. 2 Whites, Repacked	3.00/ 3.50
No. 2 Whites, Miscellaneous	2.50/ 2.75
Blue Overalls	3.50/ 4.00
Thirds and Blues Repacked	2.25/ 2.75
No. 1 Roofing Rags	1.40/ 1.50
No. 2 Roofing Rags	1.25/ 1.35
No. 3 Jute Bagging	1.15/ 1.25
No. 4 Brussels & hrd. bck'd crpts.	1.25/ 1.35
No. 5A Roofing Rags	1.25/ 1.35

New Foreign Cotton Cuttings

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	$5.50/ $5.75
New Mixed Cuttings	6.25/ 6.50
Light Silesias	9.25/ 9.50
Light Flannelettes	9.25/ 9.50
New White Cuttings	12.00/ 13.00
New Unbleached Cuttings	12.25/ 13.00
Fancy Shirt Cuttings	6.50/ 7.00
Light Prints	7.75/ 8.00
Bleachable Khaki, No. 1	7.00/ 7.50
Unbl. Khaki, No. 1	6.25/ 6.75

Old Foreign Rags

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Cottons	— / —
No. 2 White Cottons	— / —
No. 3 White Cottons	— / —
No. 4 White Cottons	3.50/ 3.75
Extra Light Prints	6.50/ 7.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	4.00/ 4.50
Dutch Blue Cottons	5.25/ 5.50
Checks and Blues	3.25/ 3.50
Linsey Garments	2.15/ 2.25
Dark Cottons, European	2.00/ 2.10
Dark Cottons, Egyptian	1.90/ 2.00
Old Shopperies	nominal
New Shopperies	nominal

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$8.00/ $8.50
Domestic Gunny, No. 1	7.50/ 8.50
Heavy Wool Tares	7.50/ 7.75
No. 1 Scrap Bagging	7.25/ 7.50
Roofing Bagging	1.10/ 1.20
Foreign Manila Rope	5.50/ 5.75
Domestic Manila Rope	6.00/ 6.25
Jute Strings	7.00/ 7.25
No. 1 Sisal Strings	5.25/ 5.50
Mixed Strings	1.50/ 1.75

Waste Paper

Base Prices to Mills for Average Packings
F.o.b. New York, Baled

	(Per Ton)
No. 1 Hard White Envelope Cuts	95.00/ 100.00
No. 1 Hd. Wh. Shavings, unruled	80.00/ 85.00
Super Soft White Shavings	80.00/ 85.00
No. 1 Soft White Shavings	60.00/ 65.00
No. 1 Fly Leaf Shavings	40.00/ —
No. 1 Gd'wd Fly Leaf Shavings.	30.00/ 35.00
No. 1 Heavy Books & Magazines	19.00/ 21.00
Mixed Books	13.00/ 15.00
No. 1 White Ledger	45.00/ 50.00
Col. Ledger	35.00/ 40.00
Manila Tab. Cards	50.00/ 55.00
New Manila Envelope Cuttings	60.00/ 65.00
Extra Manilas	20.00/ 25.00
Mxd. Kraft, Bag Cuttings	45.00/ 55.00
Kraft Envelope Cuttings	55.00/ 65.00
Triple Sorted, No. 1 Brown Soft Kraft	35.00/ 40.00
New Kraft Corrugated Cuttings	30.00/ 35.00
No. 1 Assorted Old Kraft	30.00/ 35.00
Used Kraft Bags	30.00/ 35.00
New Jute Corrugated Cuttings	18.00/ —
Old Corrugated	14.00/ 15.00
No. 1 News	13.00/ 14.00
No. 1 Mixed Papers	6.00/ 7.00
Box Board Cuttings	7.00/ 8.00
White Blank News	60.00/ 65.00
Overissue News	17.00/ 18.00
Sulphite Mill Wrappers	12.00/ 14.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)

Coarse Polished—India	.35½/ .36½
Fine Polished India	.41½/ .45
Unpolished—Paper Makers	.32¼/ .34½
Tube Rope	.33¼/ .35½
Wrapping	.36 / .38¼
Cotton	.58 / .60
Polished Cotton	.55 / —

(Hard Fiber)

Mex. Sisal	.21 / .27
Manila (Reprocessed)	.31 / .35

(American Hemp)

Polished Hemp	.46½/ .48
Unpolished	.35 / .37¼

PHILADELPHIA

Domestic Rags (new)

(F.o.b. Eastern Shipping Point)

White Shirt	.10½/ .11
Light Silesias	.07½/ .08
Black Silesias, soft	.05½/ .06
Unbleached Muslin	.10½/ .11¼
Washable Prints	.06½/ .07
Washable No. 1	.05 / .05½
Blue Overall	.07½/ .08
Washable Shredding	.02¾/ .03¼
Fancy Percales	.06¾/ .07¼
Unbleachable Khaki	.05½/ .06½
Bleachable Khaki	.06¼/ .06¾
Men's Corduroy	.05½/ .06
Ladies' Corduroy	.05 / .05½
Cottonades	.05½/ .06

Domestic Rags (Old)

(F.o.b. Eastern Shipping Point)

White No. 1—Repacked	4.50 / 5.00
Mixed White	4.00 / 4.25
White No. 2—Repacked	3.50 / 3.75
Thirds and Blues—	
Miscellaneous	2.50 / 2.75
Repacked	3.00 / 3.25
Domestic No. 1 Roofing Stock	1.55 / 1.60
Domestic No. 2 Roofing Stock	1.45 / 1.50
Roofing Bagging	1.35 / 1.40
Old Manila Rope	— / 5.50

(Continued on page 32)

World Wood Pulp Markets at a Glance

Fourth-Quarter Contract Prices, Per Short Air-Dry Ton

	Delivered, with varying freight allowances		On dock Atlantic Ports		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$80.00/$81.00	$80.00/$85.00			
Sideruns Pulping News		80.00/ 90.00			
Soda, Bleached	130.00/135.00	130.00/ —			
Sulphate, Bleached	136.00/155.00	147.50/150.00	$165.00/ —		
Sulphate, Unbl'd North'n	120.00/130.00	115.00/125.00	127.50/ —	127.50/ —	
Sulphate, Unbl'd South'n	110.00/115.00				
Sulphite, Bleached	125.00/135.00	125.00/135.00	165.00/ —	165.00/ —	165.00/ —
Sulphite, Unbleached	124.00/ —	125.00/126.00	140.00/149.00	140.00/143.00	
Sulphite, Unbl'd (Glassine) (no freight allowed)		120.00/ —			

First Quarter Indications

Bleached Sulphate, U. S., $136.00/145.00/ — ; Canadian, $147.50/150.00

Unbleached Sulphate, U. S., Northern, $120.00/130.00; Canadian $115.00/125.00 with increased freight allowances.

Unbleached Sulphite, Canadian; $125.00 with increased freight allowance.

Maybe you **ARE** getting good production

. . . but couldn't you get **BETTER** if you used more Stainless Steel?

OTHERS are doing it. They have found that a sure way to boost production is to use Stainless Steel where corrosion-resisting construction is required—where there is danger of product contamination—where down-time for repairs and replacement must be reduced.

It is not mere coincidence that those mills whose production records are consistently among the highest in the country are also the biggest users of Stainless Steel. Most of them have been using Stainless Steel for years and have been consistently extending its application. Here are a few facts their experience with Stainless has developed:—

Digester outlet nozzles lined with Stainless Steel take on a new lease of life . . . corrosion and erosion troubles in digester strainers are so decreased that they have stayed in service as much as 10 times longer when made of U·S·S Stainless . . . Stainless Steel rods and winding wire in cylinder molds, washers and save-alls last for years instead of weeks . . . by using U·S·S Stainless for beater bars and Jordan linings, paper contamination due to corrosion and abrasion of ordinary steel can be eliminated and far longer service is the rule . . . in a west coast mill, U·S·S Stainless tubes in the first effect of a sulphate evaporator were going strong after 8 years' service, where carbon steel tubing lasted only 9 months.

But why go on? Just remember that in every case cited here, where service life has been increased, you can be sure that mill interruptions have been proportionately reduced, and bigger output has resulted. That's why it pays to use Stainless Steel.

In U·S·S Stainless Steel we offer you a *complete* family of perfected special-purpose steels that will meet almost any requirement of pulp and paper mill service. Our engineers are specialists in its uses and will gladly assist you in selecting the proper type to ensure the greatest benefits from its application.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST TO COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

8-979

UNITED STATES STEEL

Prices

CONTINUED FROM PAGE 30

Bagging

(F.o.b. Eastern Shipping Point)

Foreign Gunny No. 1	nominal
Domestic Gunny No. 1	.07¼/ .07¾
Sisal Strings No. 1	.04½/ .05
Sisal Strings No. 2	.03½/ .04
Sisal Jute	.02¾/ .03
No. 1 Scrap	.06½/ .07
No. 2 Scrap	.03 / .03½

Waste Papers

F.o.b. Phila. Mill Prices, Baled

	Per Ton
No. 1 Hd. White Envelope Cuts.	120.00/ 125.00
No. 1 Hd. Wh. Shavings, unruled	100.00/ —
Soft White Shavings	85.00/ —
White Blank News	65.00/ 75.00
No. 1 White Ledger	65.00/ —
No. 1 Heavy Books & Magazines	20.00/ 22.00
New Manila Envelope Cuttings	75.00/ —
No. 1 Assorted Old Kraft	35.00/ 40.00
No. 1 Mixed Paper	7.00/ 8.00
Box Board Cuttings	8.00/ 10.00
New Kraft Corrugated Cuttings	55.00/ 60.00
Old Corrugated	14.00/ 16.00
Overissue News	15.00/ 16.00
No. 1 News	11.00/ 13.00

BOSTON

Waste Papers

F.o.b. Boston, Mill Prices, Baled

	Per Ton
No. 1 Hd. Wh. Shav., unruled	$135.00/ —
No. 1 Hd. Wh. Shavings, ruled	90.00/ —
Soft White Shavings	120.00/ 125.00
No. 1 Fly Leaf Shavings	45.00/ —
No. 2 Fly Leaf Shavings	40.00/ 45.00
No. 1 Grdwd. Fly Leaf Shvgs.	nominal
No. 2 Groundwood Fly Leaf Shavings	nominal
Mixed Colored Shavings	30.00/ —
New Manila Env. Cuts, one cut	75.00/ —
Hard White Envelope Cuts, one cut	120.00/ —
Triple S'ted No. 1 Br. Soft Kraft	75.00/ 80.00
Mixed Kraft Env. & Bag Cuttings	45.00/ —
Kraft Envelope Cuttings	80.00/ 90.00
No. 1 Heavy Books & Magazines	22.00/ —
New Manila Env. Cutt'gs, one cut	47.00/ —
New Manila Envelope Cuttings	80.00/ 85.00
White Tabulating Cards	80.00/ 90.00
White Blank News	65.00/ —
No. 1 Assorted Old Kraft	50.00/ —
No. 1 Mixed Paper	8.00/ 9.00
Overissue News	11.00/ 12.00
No. 1 News	11.00/ 12.00
New Corrugated Cuttings, Kraft	55.00/ 60.00
Old Kraft Corrugated Containers	35.00/ —
Old Corrugated Containers	13.00/ 14.00
Paper Strings	40.00/ 45.00

Bagging

(F.o.b. Boston)

	(Per 100 lbs.)
Foreign Gunny	nominal
Domestic Gunny	8.25 / —
Domestic No. 1 Old Rope	6.00 / 6.50
Foreign No. 1 Old Rope	5.75 / 6.00
Mixed Strings	1.35 / —
Transmission Rope—	
Domestic	3.00 / —
Jute Carpet Threads	— / 4.00
Bleachery Burlap	— / 9.00
Scrap Burlap—	
Foreign	6.75 / 7.00
Domestic	7.00 / 7.25
South America	6.75 / 7.00
Austr. Wool Pouches	8.00 / —
New Zealand Wool Pouches	— / 5.50
New Burlap Cuttings	8.50 / —
Heavy Baling Bagging	8.00 / 8.50
Paper Mill Bagging	— / 6.00
No. 1 Roofing Bagging	— / 1.40

Domestic Rags (New)

(F.o.b. Boston)

	(Per 100 lbs.)
New Light Prints	nominal
Fancy Percales	7.00 / —
White No. 1 Shirt	11.00 / —
Light Flannelettes	8.00 / —
Canton Flannels, Bleached	10.00 / —
Underwear Cutters, Bleached	11.00 / —
Underwear Cutters, Unbleached	10.50 /12.00
Silesias No. 1	7.25 / —
Black Silesias	4.50 / —
Red Cotton Cuttings	4.50 / —
Blue Overalls	— / 8.00
Soft Unbleached	11.00 / —
Blue Cheviots	7.00 / —
Fancy	5.50 / —
Washable	6.00 / —
Khaki Cuttings	6.00 / —
Corduroy	4.00 / —
Men's Corduroy	4.50 / —
Khaki Canvas	— / 6.00
B. V. D. Cuttings	11.00 / —

Domestic Rags (Old)

(F.o.b. Boston)

	Per 100 lbs.
No. 1 Whites, Repacked	4.00 / 4.25
No. 1 Whites, Miscellaneous	3.00 / 3.75
No. 2 Whites, Repacked	2.50 / —
No. 2 Whites, Miscellaneous	2.25 / —
Twos and Blues, Repacked	1.75 / 2.00
Old Blue Overalls	3.00 / 3.25
Thirds and Blues, Repacked	1.75 / 2.00
Black Stockings	nominal
No. 1 Roofing Stock	— / 1.45
No. 2 Roofing Stock	— / 1.35
No. 3 Roofing Stock	— / .90
No. 4 Roofing Stock	— / .90
No. 5, Quality A.	— / 1.20
Old Manila Rope	6.00 / —

CHICAGO

Waste Paper

(F.o.b. Chicago) Mill Prices, Baled

Shavings—	
No. 1 Hard White Envelope cuts, one cut	$100.00/ —
No. 1 Hard White Shavings, unruled	90.00/ —
No. 1 Soft White Shavings	80.00/ —
No. 1 White Ledger	60.00/ —
No. 1 Heavy Books & Magazines	28.00/ 30.00
White Blank News	50.00/ —
Mixed Kraft Env. & Bag Cuttings	70.00/ —
No. 1 Assorted Old Kraft	25.00/ —
Overissue News	22.00/ —
No. 1 News	— / 18.00
No. 1 Mixed Paper	9.00/ —
Old Corrugated	14.00/ 15.00
Mill Wrappers	11.00/ —

Markets

Blanc Fixe

Supply good; demand steady. Pulp is currently quoted at $85.00 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $75.00 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Demand strong. Prices unchanged. Supply adequate. Prices range from $4.25 to $4.75 per 100 pound drums, l.c.l., works.

Casein

Demand weak. Domestic prices nominal. Manufacturers' holdings good. Trading imported product dull. Impending Argentine export tax of 8 percent disturbs dealers. Current prices on processed acid precipitated casein at 28½ to 32 cents per pound for domestic grades and 25½ to 27 cents for imported grades, f.o.b. shipping point.

Caustic Soda

Easier demand has improved supply of liquid types. Flaked and solid improving but still tight. Some 1949 contracts being written at adjusted levels. Solid caustic is reported at $3.10/$3.20 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.45 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.50 per cwt.; liquid 73 percent in tank cars at $2.60 per cwt., at works.

China Clay

Demand steady. Supply excellent. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse

Chlorine

Pickup in demand tightens supply. Shortage of tankcars and multi-unit containers hampers delivery. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-tank cars, f.o.b., works.

Rosin

Savannah and local markets unchanged. Demand easy. Prices steady. Export activity good. Gum rosin in drums per 100 pounds net in car lots, f.o.b., Savannah; B, $6.50; G, H, I, K, $7.72. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

Rosin Size

Heavy demand. Supply good. Seventy percent gum and pale wood grades, tank cars, $6.30 to $6.40, f.o.b. southern shipping point.

Salt Cake

Demand and supply somewhat easier. Production under contract. Domestic salt cake quoted at $27.00, f.o.b. shipping point, freight allowed to destination.

Soda Ash

Increased production and eased demand from other industries makes supply condition favorable. Deliveries close to schedule. Current prices sustained in some 1949 contracts. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Sodium Bicarbonate

Production good. Demand eased by better supply of other alkalis. Reported as $1.95 per cwt. paper bags, carload lots.

Starch, Corn

Demand moderate. Supply ample. Prices firm parelleling corn markets. Pearl grade quoted at $5.41 per 100 pounds; powdered starch at $5.52 per 100 pounds; car lots, New York.

Starch, Potato

Demand fair. Prices stronger though largely nominal. Supply ample. High grade quoted at $4.80/$5.00 cwt. f.o.b. Idaho; $5.10/$5.25 f.o.b. Aroostook; Pearl grade $5.00/$5.15 cwt. f.o.b. Aroostook.

Sulphate of Alumina

Demand increased. Supply steady. The commercial grades are quoted from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur

Demand active. Supplies steady. Production up 3 percent. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $22.00 per long ton.

Talc

Demand continues in excess of supply. Improvement seen by early 1949. Prices steady. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in car lots.

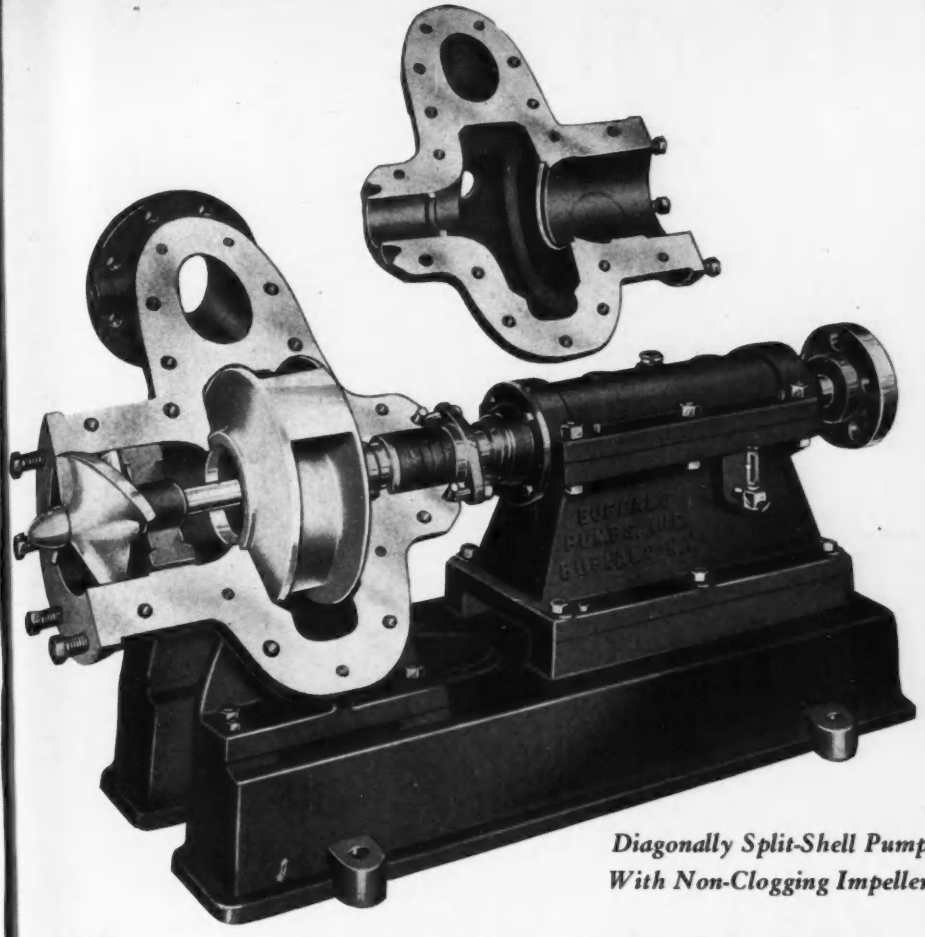
Tapioca Flour

Market quiet. High grades in fair supply. Steady improvement in buying noted. Superior highs range from $10.25/$11.50 cwt.; high grades $9.25 cwt., on dock Atlantic and Gulf ports; medium grades range from $6.00/$7.50 cwt. on dock N. Y. Coarse pearl grades, $5.00/$5.50 cwt., on dock N. Y. Medium and low grades in adequate supply.

Titanium Dioxide

Prices advance 1½ cents, actual freight allowed. Supply of paper grades continues unequal to demand. Shipments on allocation. Improvement in supply delayed to 1951. Anastase 19½c pound carload lots, 20c l.c.l., rutile, 21½c pound carload lots, 22½c l.c.l.; 50-pound bags, f.o.b. plant, actual freight allowed.

CENTRIFUGAL PUMPS FOR EVERY SERVICE



Diagonally Split-Shell Pump
With Non-Clogging Impeller

Put your STOCK PUMPING

on this "ANTI-TROUBLE" basis! —with the "Buffalo" Pump made for your job!

There's no economy in a pump that needs continual attention and repairs! Likewise, the wrong *type* of pump for a specialized stock job just isn't going to give you the *performance* you paid for. By choosing the "Buffalo" line of paper pumps, you're sure of avoiding these two troubles. "Buffalo" engineers designed these pumps—tested, redesigned and retested them—on the basis of WHAT PAPER MILL MEN WANTED. The result of this close-contact with on-the-job paper needs has been a *group* of pumps, all highly specialized. Thus, pumps for "high head" jobs—pumps for high consistency stocks—pumps for "lumpy" liquids, and so on—all non-clogging, all designed for the best possible service on special jobs. As hundreds of other paper mills have done, you can pick the RIGHT pump from the complete "Buffalo" line—a pump that will "go the distance" for you, without those costly repair stops. It's worth investigating! Write for Bulletin 953-F or contact your "Buffalo" representative, and get the full story.

PUMPS by "Buffalo"

For

- WATER ANY TEMPERATURE
- PAPER STOCKS (NON-CLOGGING)
- GENERAL SERVICE
- ACIDS
- ALKALIS
- SLURRY
- CONDENSATE RETURN
- SUMP CLEARANCE
- FIRE SERVICE
- SEWAGE
- SELF-PRIMING SERVICE

BUFFALO PUMPS, INC.

159 MORTIMER STREET BUFFALO, N. Y.
CANADA PUMPS LTD., KITCHENER, ONT.
Branch Offices in all Principal Cities

RUGGED, PRECISION CONSTRUCTION—FOR LONG LIFE

Financial Record

Preferred Stocks	Per Share Calendar Year 1947	Earnings 12 Mos. to Approx. 9/30/48	Indic. Annual Divid. Rate	Dec. 8 Closing Market Price
Armstrong Cork Co. $3.75 Cum.	$38.64*	$43.53*i	$3.75	
Armstrong Cork Co. $4.00 Cum. Conv.	38.64*	43.53*i	4.00	
Celotex Corp. 5% Cum.	24.25c	26.25g	1.00	18¾
Champion Paper & Fibre $4.50 Cum.	65.90f	43.82j	4.50	91½
Container Corp. of Amer. 4% Cum.	102.74	98.49	4.00	
Crown Zellerbach $4.20 Cum.	56.40f	59.10k	4.20	
Crown Zellerbach $4.00 Cum. Conv. 2nd	211.39f	178.01k	4.00	
Dixie Cup Co. $2.50 Cum. Conv. Cla	9.16	9.61	2.50	
Flintkote Co. $4 Cum.	81.91	87.68	4.00	
Robert Gair Co., Inc. 6% Cum.	18.01	15.97	1.20	
International Paper Co. $4 Cum.	236.51	242.27	4.00	
Johns-Manville $3.50 Cum.	128.81	175.15	3.50	105
Kimberly Clark Corp. 4½% Cum.	70.03	82.79	4.50	
Kimberly Clark Corp. 4% Cum. Conv. 2nd	95.88	114.55	4.00	96
MacAndrews & Forbes 6% Cum.	62.20	59.89	6.00	
Mead Corp. 4¼% Cum.	81.56	80.43	4.25	84
Mead Corp. 4% Cum. Conv. 2nd	53.34	51.89	2.00	34¼
Paraffine Cos. Inc. 4% Cum. Conv.	152.76a	158.96	4.00	
Rayonier Inc. $2 Cum.	13.58	16.09	2.00	32
St. Regis Paper Co. 4.40% 1st A	76.93	85.00	4.40	82
Scott Paper Co. $3.40 Cum.	43.95	54.31	3.40	89½
U. S. Gypsum Co. 7% Cum.	211.34	300.59	7.00	171
United Wallpaper Inc. 4% Cum. Conv.	(d)1.35a	(d)6.28	2.00	
West Virginia Pulp & Paper 4½% Cum.	75.75c	78.49g	4.50	104
Common Stocks				
APW Products Co.	$1.24	$1.32	$0.25	4⅛
American Writing Paper Corp.	1.61	0.02	0.25	
Armstrong Cork Co.	6.41	7.17i	3.00	48¾
Celotex Corp.	6.59c	7.15g	2.00	26½
Certain-Teed Prods. Corp.	3.75	3.99	1.15	12⅞
Champion Paper & Fibre	5.57f	3.81j	2.00	23¼
Congoleum Nairn Co.	4.55	5.12i	2.25	30
Container Corp. of America	10.09	9.54	4.50	35½
Crown Zellerbach	6.81f	6.70k	2.00	25
Dixie Cup Co.	5.87	6.26	1.00	
Eastern Corp.	5.02	6.51	1.00	
Flintkote Co.	6.27	6.28	3.00	29⅛
Robert Gair Co., Inc.	2.83	2.49	0.70	6½
Great Northern Paper Co.	4.56	4.55	2.80	
International Paper Co.	15.02	15.39	5.00	50¾
Johns-Manville Corp.	3.17	4.28	2.00	37⅞
Kimberly-Clark Corp.	4.29	5.16	1.65	21⅝
MacAndrews & Forbes Co.	3.68	3.53	2.50	36
Marathon Corp.	3.39c	3.93g	1.40	20¼
Mead Corp.	7.33	7.11	2.00	16⅜
National Container Corp.	4.13	2.86	1.20	9⅜
Paraffine Cos. Inc.	2.40a	2.50	1.20	20
Rayonier, Inc.	7.30	8.88	2.00	28
Ruberoid Co.	10.88	12.90	3.25e	
St. Regis Paper Co.	2.66	2.86	0.80	8¾
Scott Paper Co.	3.02	3.79	2.50	
Sutherland Paper Co.	6.87	6.43	2.50	36
Taggart Corp.	1.29		0.60	11
Union Bag & Paper Corp.	7.93	8.13	4.00	29½
United Board & Carton	4.95b	3.39h	1.25	7⅞
U. S. Gypsum Co.	10.00	14.36	6.00	102
United Wallpaper	(d)0.11a	(d)0.27	——	3
West Virginia Pulp & Paper	11.40c	11.56g	4.00	42⅞

(a) Year ended 6/30/48
(b) Year ended 5/30/48
(c) Year ended 10/31/47
(d) Deficit
(e) Plus stock
(f) Year ended 4/30/48
(g) 12 months to approximately 7/31/48
(h) 12 months to 8/21/48
(i) 12 months to approximately 6/30/48
(j) 5 months to 9/30/48
(k) 12 months to approximately 10/30/48
(*) Pro forma

Dividends Declared

Consolidated Paper Corp., Ltd., declared an extra dividend of 75 cents with the semi-annual dividend of 50 cents on its common stock, payable January 17. This brings payments on 1948 account to $1.75 per share, compared with $1.50 for 1947, $1 for 1946 and 50 cents for 1945. Estimated consolidated net profit for the six months ended June 30, 1948, was $6,325,155 or $2.48 on common, a substantial improvement over full year 1947, when net amounted to $9,711,871 or $3.78 per share. Annually an amount equal to 25 percent of net income, before depreciation but after all other charges, must be applied to the retirement of bonds when working capital is in excess of $10,000,000.

Barber-Ellis of Canada, Ltd., wholesale dealer and manufacturer of paper products, declared a dividend of $1.75 per share on its preferred stock, payable January 15, 1949, to shareholders of record on December 31, 1948.

Morris Paper Mills has declared a dividend of 25 cents a common share, plus a year-end payment of 40 cents, both payable on December 10 to stockholders of record November 26.

Eaton Paper Corp., has voted a dividend of $1 on its common stock, payable December 28 to holders of record of December 15.

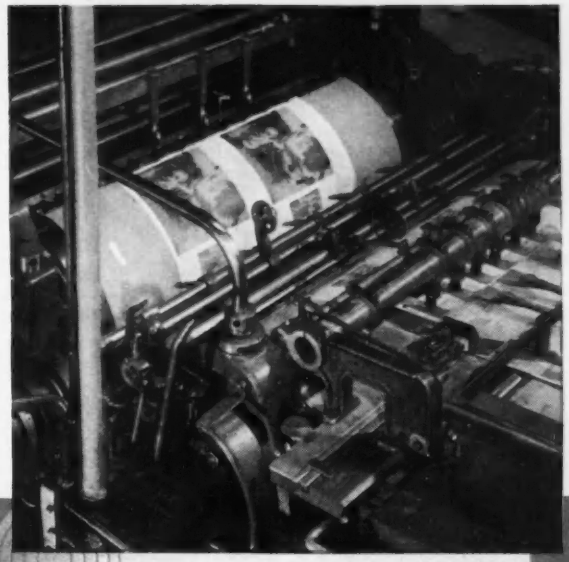
Fraser Plans Stock Split

OTTAWA. — After announcing proposed subdivision of shares and issuance of $5 millions of preferred stock, the directors of the Fraser Cos., have indicated in a letter to shareholders that the company has spent over $16 millions out of earnings from January 1, 1938, to August 31, 1948, for plant equipment and lands, and at the same time reduced funded debt as well as paid off bank loans of about $8 millions, with the working capital increased by $2 millions. Approximately $5 millions, it is estimated, will be spent in 1949 on unfinished projects of the company.

Without including pulp converted into paper products at the company's own plants, the annual capacities of the pulp and paper-making units in its plants, on the basis of 300 operating days and on comparable grades, have been advanced from 153,000 tons in 1937 to 198,000 tons in 1948, it being estimated that this will go up further to 231,000 tons in 1950.

Major projects now in progress are reported as follows: new unbleached sulphate mill, Newcastle, N.B.; sulphate bleaching plants, Edmunston, N.B.; facilities for delivery, storage of bleached sulphate pulp; new turbine generating unit; new steam generating unit; replacements of obsolete and worn out equipment and improvements. Major projects already completed include those at Edmundston plant; in Restigouche County, Atholville, and Fraser Paper Co., Madawaska, Maine.

The directors' statement indicates that this program to date has been responsible for increasing productive capacities of these plants and for a large percentage of earnings in the last few years, with the directors stating that it is not proposed at the present time to issue any of the unissued common shares after the proposed subdivision of the common share.



★ SHARPER HIGHLIGHTS IN HALFTONES

★ EXCELLENT PRINTING CUSHION

★ SMOOTHER SURFACE FINISH

paper coated with

DOW LATEX 512K

meets the supreme test . . . on the press

Clay-coated papers utilizing Dow Latex 512K give clean, sharp highlights in halftones, and offer a superior printing cushion in letterpress printing.

The thermoplastic nature of Dow Latex 512K permits it to flow under application of heat and friction in the supercalendering operation. This results in a smoother and glossier coated surface with sufficient softness to provide an ideal printing cushion.

Offer these advantages to your paper customers in the printing trade today at no increase in cost. Contact your nearest Dow Sales Office for any additional information.

Coatings Section • Plastics Division, Dept. PC-25

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle • Dow Chemical of Canada, Limited, Toronto, Canada

Meetings

ASSOCIATION EXECUTIVES: Please send us your meeting dates and locations for this column as far in advance as possible. No charge for publication.

1949

JANUARY 13: American Society for Testing Materials, Philadelphia District, Franklin Institute.

JANUARY 20-21: Finance Conference, American Management Ass'n., Hotel Pennsylvania, New York.

JANUARY 26-28: Canadian Pulp & Paper Ass'n. Annual Convention, Mt. Royal Hotel, Montreal 2, Canada. For further details, write to Douglas Jones, secretary, Canadian Pulp & Paper Ass'n., 3420 University avenue, Montreal, Canada.

JANUARY 27: Technical Ass'n. of the Pulp & Paper Industry, Delaware Valley Section, Engineers Club, 1317 Spruce street, Philadelphia, Pa. For details, write to Miss L. V. Hans, secretary-treasurer, 1010 Delaware avenue, Wilmington, Del.

FEBRUARY 3: American Society for Testing Materials, New York District, Engineering Society Building.

FEBRUARY 9: Southern Pulpwood Conservation Ass'n., Atlanta Biltmore Hotel, Atlanta, Ga.

FEBRUARY 10: American Society for Testing Materials, Philadelphia District, McAllister's, 1811 Spring Garden Street.

FEBRUARY 14-16: Personnel Conference, American Management Ass'n., Palmer House, Chicago.

FEBRUARY 20-25: Annual Convention, American Paper & Pulp Ass'n., Hotel Waldorf-Astoria, New York. For details, write to E. W. Tinker, Executive Secretary, 122 East Forty-Second Street, New York 17, N. Y.

FEBRUARY 20-25: Technical Ass'n. of the Pulp & Paper Industry, Annual Convention, Hotel Commodore, N. Y. For details, write to R. G. Macdonald, secretary, Technical Ass'n. of the Pulp & Paper Industry, 122 East 42nd street, New York City 17.

FEBRUARY 21: National Council for Stream Improvement, Research Group Leaders' Conference (10:00 a.m.), 271 Madison avenue, New York 16, N. Y. For details, write to National Council for Stream Improvement, 271 Madison avenue, New York City 16.

FEBRUARY 22: SAPI Luncheon, Hotel Waldorf-Astoria. For details, write to E. G. Amos, Secretary-Treasurer, Salesmen's Ass'n. of the Paper Industry, 122 East Forty-Second Street, New York 17, N. Y.

FEBRUARY 22: National Council for Stream Improvement, Joint Meeting Regional Chairmen & Technical Planning and Budget Committee (10:00 a.m.), 271 Madison avenue, New York City 16. For details, write to National Council for Stream Improvement, 271 Madison avenue, New York City 16.

FEBRUARY 23: National Council for Stream Improvement, Annual Meeting —Board of Governors (10:00 a.m.). Annual Meeting of Members (Regulatory representatives and others will be welcome at this meeting), 2:00 p.m. Meeting of New Board of Governors (5:00 p.m.), 271 Madison avenue, New York City 16. For details, write to National Council for Stream Improvement, 271 Madison avenue, New York City 16.

FEBRUARY 28-MARCH 4: Spring Meeting and A.S.T.A. Committee Week, American Society for Testing Materials, Edgewater Beach Hotel, Chicago.

MARCH 17-18: Marketing Conference, American Management Ass'n., Hotel Pennsylvania, New York.

MARCH 22: American Society for Testing Materials, Philadelphia District. Franklin Institute.

MARCH 24: Technical Ass'n. of the Pulp & Paper Industry, Delaware Valley Section, Engineer's Club, 1317 Spruce street, Philadelphia. For details, write to Miss L. V. Hans, secretary-treasurer, 1010 Delaware avenue, Wilmington, Del.

APRIL 4-6: National Paper Trade Ass'n., Semi-Annual Convention, Waldorf-Astoria, N. Y. For details, write to A. H. Chamberlain, executive secretary, National Paper Trade Ass'n., 220 East 42nd street, N. Y.

APRIL 14-15: Production Conference, American Management Ass'n., Hotel Pennsylvania, New York.

APRIL 28: Technical Ass'n. of the Pulp & Paper Industry, Delaware Valley Section, Engineer's Club, 1317 Spruce street, Philadelphia, Pa. For details, write to Miss L. V. Hans, secretary-treasurer, 1010 Delaware avenue, Wilmington, Del.

MAY 10-12: Packaging Conference, American Management Ass'n., Auditorium, Atlantic City, N. J.

MAY 10-13: Eighteenth National Packaging Exposition, Public Auditorium, Atlantic City, N. J. For details, write to Mr. James O. Rice, Sec., 330 West 42nd St., New York, N. Y.

MAY 19-20: Institute of Paper Chemistry, Thirteenth Annual Executives Conference, Appleton, Wis. For details, write to John G. Strange, secretary.

MAY 26: Technical Ass'n. of the Pulp & Paper Industry, Delaware Valley Section, Engineer's Club, 1317 Spruce street, Philadelphia, Pa. For details, write to Miss L. V. Hans, secretary-treasurer, 1010 Delaware avenue, Wilmington, Del.

MAY 26-27: Insurance Conference, American Management Ass'n., Hotel New Yorker, New York.

JUNE 8-9: General Management Conference, American Management Ass'n., Hotel Pennsylvania, New York.

JUNE 15-17: American Pulp & Paper Mill Superintendents Ass'n., Inc., 1949 Convention, Chalfonte Haddon Hall, Atlantic City, N. J. For details, write to George W. Craigie, secretary-treasurer, 220 East Forty-second street, New York City 17.

JUNE 17-18: Paper and Twine Ass'n., French Lick Springs, Indiana. For details, write to Mr. John L. Richey, Sec.-Treas., Suite 651-653, Hotel Sinton, Cincinnati 2, Ohio.

JUNE 27-JULY 1: Annual Meeting, American Society for Testing Materials, Chalfonte-Haddon Hotel, Atlantic City, N. J.

OCTOBER 10-14: West Coast Meeting, American Society for Testing Materials. (First national meeting of ASTM on West Coast.) Fairmont Hotel, San Francisco, California.

OCTOBER 24-28: National Safety Council, 1949 National Safety Congress, Chicago. For details, write to Harley B. Goodrich, National Safety Council, 20 North Wacker drive, Chicago 6, Ill.

NOVEMBER 1-5: Pacific Chemical Exposition, California Section, American Chemical Society, San Francisco Civic Auditorium, San Francisco, Calif. For details, write to Marcus W. Hinson, exposition manager.

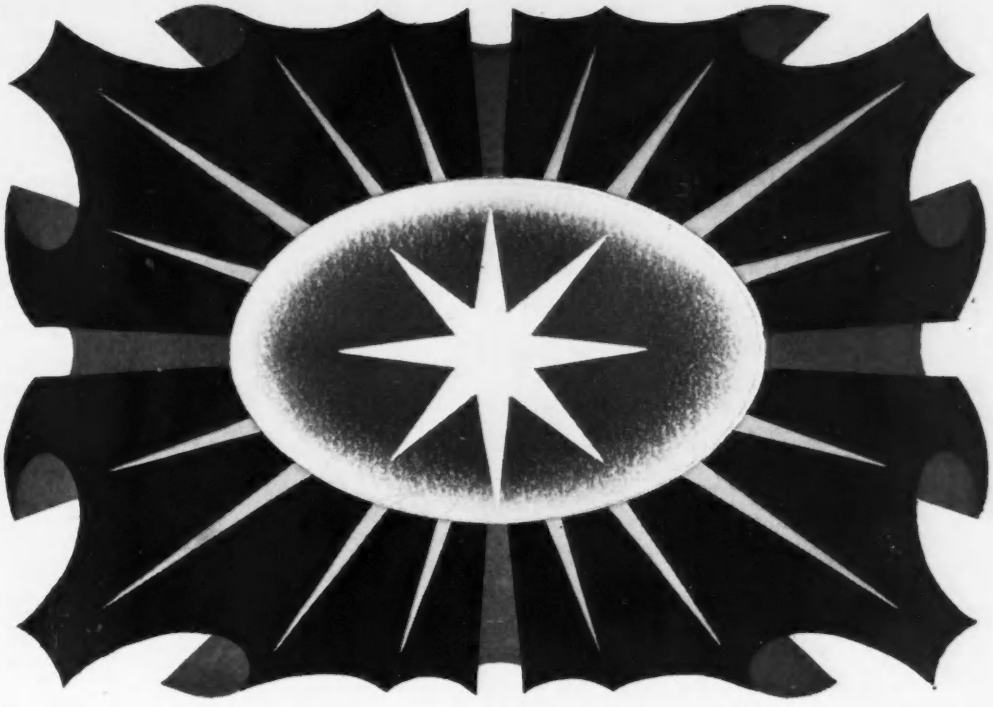
Lake States TAPPI Meet

APPLETON, Wis. — "Papermaking Fibers from Agricultural Crops" will be the subject of the Lake States Section of TAPPI at the American Legion Clubhouse, 800 North Superior street, at 6:30 P. M., December 14. Speakers include Dr. F. Lewis, S. D. Wells and Dr. S. Aronovsky.

Dr. Aronovsky will review the use of straw as a source of papermaking fibers; Mr. Wells will discuss the applications of sugar cane, cornstalks and possibly bamboo in the papermaking process; and Dr. Lewis will act as chairman and arbiter for the discussion.

Taylor SAPI's Speaker

NEW YORK—M. N. Taylor, executive director of Trees for Tomorrow, will screen the new film, "Green Frontiers" at the luncheon meeting of the Salesmen's Ass'n. of the Paper Industry at Midston House, December 13.



Gem quality

That's the kind of rolls turned out by

Langston Slitters and Winders.

Dense, square-edged—cut clean and true.

There is a type and size for every need.

Samuel M. Langston Company, Camden, New Jersey.

Langston

SLITTERS AND ROLL WINDERS

Obituary

Adolph Warshow, chairman of the board of directors of the Majestic Paper Corp., New York City, wholesale dealer in fine papers, died in Miami-Battle Creek Sanitarium, Miami, Fla., on November 29, after a long illness. Surviving are his widow, Mrs. Rosa Warshow; two sons, Walter and Robert Warshow; a stepson, Peter L. Mintz; two daughters, Mrs. Earl Sharp and Mrs. Edward Robertson; a stepdaughter, Mrs. Robert V. Sager; a sister, Mrs. Florence Tonkon; and a brother, Samuel Warshow.

Carl Kersting, 77, a salesman for 40 years with the National Folding Box Co., with offices in the Chrysler building, New York City, died at his home, 620 Fort Washington avenue, on November 24. Surviving are a stepson, William C. Shaw, and two sisters, Miss Lillian M. Kersting and Mrs. Florence Talmadge.

Empire-Allied Meeting

SYRACUSE, N. Y.—One hundred representatives of the Empire State Paper Ass'n., and the Allied Paper Salesmen's Ass'n., gathered on November 30 for quarterly sessions and a joint luncheon at Hotel Syracuse.

Addressing the luncheon group was George W. Shine, New York City, field representative of the National Paper Trade Ass'n., who pointed to the large turnover in business as he compared the sale of paper by the association to the national income. Mr. Shine said to multiply the national income by 58½ and you will have the total amount of paper sold by distributors.

Presiding at the Allied Paper Salesmen's meeting was a Syracusan, Mel S. Kelley. President, Butler Cox of Rochester presided at the Empire Ass'n. session.

Nine Paper Lectures

VANCOUVER, B.C.—The University of British Columbia has scheduled a series of nine lectures to be given under the auspices of the Pulp & Paper Research Institute of Canada in cooperation with the university and the Canadian Pulp & Paper Ass'n., Western Branch.

The first lecture was given on November 23 by Leander Manley, secretary-treasurer of the CPPA Western Branch, under the title of "The Importance of the Pulp and Paper Industry to Canadians". The second lecture, "Forest Management", was delivered on December 2 by John Liersch, assistant vice-president of the Powell River Co., Ltd.

The seven remaining lectures, to be delivered during 1949 are as follows: January 5—"Wood Procurement and Utilization", by H. J. Hodgins, chief forester, Pacific Mills Ltd.; January 20—"Sulphate Pulping", by J. Petrie, manager, pulp division, Bloedel, Stewart & Welsh Ltd.; February 1—"Sulphite Pulping", by L. K. Bickle, chief chemist, British Columbia Pulp & Paper Co., Ltd., Woodfibre, B.C.; February 16—"Mechanical Pulp", by D. J. MacLaurin, control superintendent, Powell River Co., Ltd., Powell River, B.C.; March 3—"Recent Developments in Research" (Part 1—Mechanical, Semi-Chemical and Waste Products), by Dr. R. Patterson, research chemist, Powell River Co., Ltd.; March 17—(Part 2—Chemical Celluloses), by L. K. Bickle, chief chemist, British Columbia Pulp & Paper Co., Ltd.; and March 30—"Engineering in British Columbia's Pulp and Paper Industry", by H. M. Lewis, general manager, Sorg Pulp Co., Ltd.

N. Y. Quartermaster Bids and Awards

Invitation to bid has been issued by the New York Quartermaster Purchasing Office, 111 East 16th Street, New York City, on the following items:

QM-30-280-49-608 covering: Paper, Book, Machine Coated, white, size 25" x 38"—600 reams. Paper, Cover stock, #1 Sulphite, sub 65, Scarlet, ripple finish 20" x 26"—40 reams. Board, Bristol, post card, cream sub 94 22¼" x 28½"—50 reams. Bid opening: 13 Dec. '48 at 1:30 PM (EST) at the New York office. Delivery: by 31 Jan. 1949, if unable by 15 Feb. 1949.

Invitation No, 3858—Kraft, brown, wrapping paper—32,000 lbs. (160,000 sheets). Bid opening 7 Dec. 1948 at the New York office. Delivery: in 30 days to the Naval Recruiting Bur., Baldwin, L. I.

Invitation No. 3753—Paper, white duplicating —135,300 reams. Bids will be opened 8 December 1948 at the New York office. Delivery: Dec. 1948, March and June 1949 to various destinations.

Invitation No. 3714—Paper, manifold, various colors and sizes, 32,780 reams. Bid opening: 9 Dec. 1948. Delivery: 60 days to various destinations.

Invitation No. 3752—Paper, mimeograph, various sizes and colors—approx. 113,140 reams. Bid opening: 14 Dec. 1948 at the New York office. Delivery: Jan., March and June 1949 to various destinations.

Invitation No. 3692—Paper, bond, various sizes and colors—approx. 54,450 reams. Bid opening: 14 Dec. 1948 at the New York office. Delivery: 60-90 days to various destinations.

Invitation No. 3755—Paper, index, chemical wood, bristol, single ply, rosin-sized, substance 220 M, various colors and sizes—876,800 sheets. Bids will be opened 21 Dec. 1948 at the New York office. Delivery: Jan., March and June 1949 to various destinations.

Army Awards

Awards have been made on the following items:

QM-30-280-49-218 covering various items of packing material, to:

Mathers Lamm Paper Co., Wash., D. C.—15,000 sheets corrugated board @ $250.00 M.

Packaging Div., E. W. Twitchell, Inc., Philadelphia,—850 rolls Paper, Wrapping Kraft—36" wide @ $10.35 CW. 360 rolls paper, Wrapping Kraft (48" wide) @ $10.35 CW.

Arkell Safety Bag Co., New York, N. Y.—400 rolls paper, waterproof, barrier material, 72" wide—@ $15.62 roll.

Dennison Mfg. Co., Framingham, Mass.—70,000 each tags, shipping, w/o strings—3¾" x 1⅞"—@ $.003 each. 750,000 ditto (6¼" x 3⅛")—@ $.00705 ea.

Specialty Package Div., Leeds Sales Co., Inc., New York City—3,500 rls cushioning material—@ $3.90 roll. 60,000 bags—waterproof, non-heat sealing: 3" x 5"—@$.00305. 28,000 ditto (4" x 8")—@ $.00580. 120,000 ditto (6" x 10")—@ $.00795. 35,000 ditto (8" x 12")—@ $.01215.

Enterprise Paper Co., Philadelphia—1,600 rolls paper, w.p. barrier material—@ $.8.65 CWT. 100,000 bags, w.p., greaseproof—@ $4.43 M.

McLaurin-Jones Co., Brookfield, Mass.—10,000 rolls tape, gummed, kraft, 2" wide—@ $.40964. 2,200 ditto (3" wide)—@ $.61446.

Minnesota Mining & Mfg. Co., St. Paul, Minn. —87,000 rolls tape, transparent pressure, sensitive—@ $.83—$2.49.

Kupfer Bros. Paper Co., Chicago, Ill.—75,000 bags, waterproof, greaseproof, 8" x 12"—@ $.016. 20,000 ditto (12" x 32")—@ $.055.

Newark Paraffine & Parchment Co., Newark, N. J.—500 rolls paper, greaseproof, barrier mat'l —@ $39.76.

Simplex Paper Corp., Adrian, Mich.—55 rolls paper w.p., barrier mat'l Type C-1—@ $10.97. 400 ditto (Type L-2)—@ $16.34.

Southern Packaging Corp., Washington, D. C —280,000 ea. bags, greaseproof, non-heating, sealing—@$2.44 M to $10.55 M. 785,000 ditto—waterproof—@ $3.86 M to $10.85 M. 75,000 ditto—non-heat sealing @ $4.00 to $6.58 M. 235,000 ea. bags, waterproof, greaseproof—@ $3.89 M.

Specialty Converters, East Braintree, Mass. 1,500 rolls paper, waterproof, barrier—@ $13.40.

United Mineral & Chemical Corp., New York City—375,000 ea. bags, waterproof, greaseproof—@ $.0026.

Kimberly-Clark Corp., Neenah, Wis.—6,000 rolls Wadding, cellulose—@ $12.10.

This procurement is for the U. S. Army . . .

QM-30-280-49-252 covering paper, toilet tissue, to:

Ashland Paper Mills, New York, N. Y.—12,500,000 rolls—@ $.070516 to $.0792 per roll.

National Paper Corp. of Pa., Ransom, Pa.—500,000 rolls—@ $.0685.

Ginsburg Bros., Inc., Somerville, Mass.—750,000 rolls—@ $.08.

This directive quantity was: 11,000,000 rolls.

This procurement is for the U. S. Army . . .

QM-30-280-49-432 covering tape, blank, recording to Link Paper Co., New York 7, N. Y.—450,000 ea. @ $.216 to $.255. Directive quantity was: 450,000 ea. for roll. This procurement is for the U. S. Army.

Navy Awards

Awards have been made by the Navy Purchasing Office on the following items:

Invitation No. 3532 covering file folders to: Acme File & Envelope Co., New York, N. Y. —11,000 ea.—@ $.096. 5,000 ea.—@ $.119.

Koller & Smith, New York, N. Y.—99,500 ea. —@ $58.80 per M set.

Dunleavy Co., Boston, Mass.—60,500 ea.—from: $.04554 to $.0483 ea.

Smead Mfg. Co., Hastings, Minn.—32,500 ea. —@ $.041 ea.

Directive quantity was: 208,500 ea.

Invitation No. 3786 covering capacitors, paper, tubular to: Cornell-Dubilier Elec. Corp., South Plainfield, N. J.—8,150 from: $.0515 to $.13218.

–count on UFORMITES 467 and 470 to meet requirements at low cost

Sanitary garbage bags *must* have high wet strength properties to prevent breakage. Here, as in many other applications, the UFORMITES supply that important quality . . . efficiently, economically.

UFORMITE 467 was specifically developed for use with Kraft by beater addition. UFORMITE 470 is recommended especially for sulfite stocks but can be used advantageously with Kraft, rag and groundwood.

If you are manufacturing bags, wrapping paper, toweling, soft tissues, glassine, map, chart or ledger paper, you'll want to use these urea formaldehyde resins. Why? Because neither UFORMITE 467 nor UFORMITE 470 affects the color, odor or taste of paper. Because no special equipment or handling is required for their preparation or use. Because as little as 1% resin on dry fibre weight will increase wet strength as much as 300%. Because the UFORMITES improve dry tensile and Mullen, fold, uniformity of sizing, and coating service characteristics.

See for yourself how the UFORMITES, at low cost, can increase the value of your paper production. Write for full details today.

UFORMITE *is a trade-mark, Reg. U.S. Pat. Off.*

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square Philadelphia 5, Pa.

The Resinous Products Division was formerly The Resinous Products & Chemical Company

NEKOOSA-EDWARDS ANNUAL SALES CONFERENCE

Sales representatives and officials of Nekoosa-Edwards Paper Co. gathered at the main office conference room for their sixteenth annual sales conference November 16-18. . . . Reading from left to right, first row, are Carl A. Schiebler, assistant general sales manager; Margaret Olson and Myrtle Schaffenberger, secretaries; R. A. Love, order department manager; Adam C. Remley, vice president in charge of sales; I. N. Frisby, Chicago office head; N. E. Nash, vice president; and John E. Alexander, president and general manager. . . . Second row, Marvin E. Love, assistant advertising manager; K. B. Podvin, Port Edwards; L. A. Gardiner, Los Angeles; C. A. Hodlmair and Arthur L. Brown, Chicago office; S. A. Casey, counsel; C. H. Reese, vice-president in charge of manufacturing; W. E. Nash, Jr., and John H. Manske, Chicago office; M. A. Vanderheiden, New York office head; Gerald Higgs, Port Edwards; and Laurence J. Lyons, Chicago. . . . Third row, C. A. Polansky, Port Edwards; G. S. Booton, New York; W. M. Kersten, Port Edwards; D. H. Boles, order department-specialty papers; F. Ward Rosebush, Atlanta; Tad R. Meyer, advertising manager; H. J. Hostvedt, order department-fine papers; Karl F. Schmidt, Port Edwards and Ray W. Herzog, Erie.

MacKinnon Explains Conference Purpose

OTTAWA—In a statement explaining the Canadian government's purpose in sponsoring a conference of pulp-producing countries, Minister of Mines and Resources James MacKinnon said here it is important that the pulpwood industries should be planned "with due regard to the permanent capacity of the forests to yield the necessary raw materials."

Mr. MacKinnon pointed out that delegates from 19 countries are expected, with observers from other countries attending as well. It appeared that a study of conservation policies and future market prospects would be foremost among the delegate discussions, he stressed.

The Canadian Pulp & Paper Ass'n., will take an active part in the work of the conference, he added. "The main purpose of the meeting will be to give experts an opportunity to review the world position and to decide whether any steps are needed to achieve, both for the immediate and the more distant future, the necessary equilibrium between supplies and requirements and supplies," Mr. MacKinnon stated.

Construction of pulpmills in other countries is "an obviously desirable development" but raises the question of both forest capacity and future markets, he indicated. The risk of surplus capacity once the immediate needs of the next few years have been satisfied should be forestalled.

Sources here said the Canadian government is itself working out a national forest conservation policy which may be presented to Parliament as a bill at the next session and work done so far is "preparatory to legislation", with the question of introducing actual legislation depending upon the progress that can be made in negotiations with the provinces. It is understood here that it will be a purely voluntary affair so that it will be open to the provinces to come in or stay out as they may decide and no effort will be made to force them into such a policy.

Thousands View Exhibition

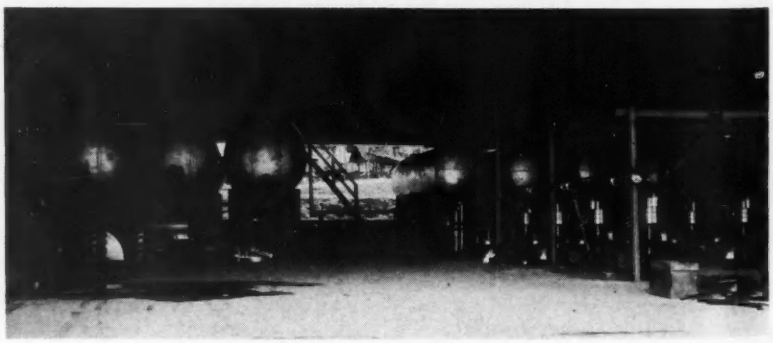
PHILADELPHIA — More than 3,000 persons viewed the printing exhibition held on November 18-19 at the Bellevue-Stratford hotel in conjunction with the 1948 Graphic Arts Conference according to joint announcements made by the General Chairman, Ralph V. DeKalb of Alfred J. Jordan, Inc., and the president of Printing Industries of Philadelphia, Inc., John S. Williams, president of Williams & Marcus Co.

Entering Paper Mill Field

NEW LISBON, Wis. — The Walker Welding & Machine Co., fabricating stainless steel and other alloys, has set up a paper mill department to serve the paper industry with such items as chest inserts, float chamber tanks, prefabricated tubing and fittings; also straight carbon steel, lead and monel. The firm is prepared to handle orders promptly, James C. Banks stated.

Mentzer to New York

WILMINGTON, Del. — Charles T. Mentzer, Jr., assistant manager of fine chemicals sales in the Du Pont Co.'s organic chemicals department, has been named sales supervisor in the department's New York office and will take his new position January 1.



LATEX PRODUCER NAMES U. S. AGENT

Centrifuges and storage tanks in the factory of Harrisons & Crosfield at Petaling, Malaya. . . . Harrisons & Crosfield, Ltd., of 1-4 Great Tower street, London, Eng. recently named the General Latex & Chemical Corp., 666 Main street, Cambridge 39, Mass., as exclusive agent for the sale of Harrisons & Crosfield latex in the United States. . . . This English firm, which has 46 offices in 12 countries was among the pioneers to establish the Hevea Brasiliensis tree as the basis of the Malayan rubber industry. Today Harrisons & Crosfield controls ten percent of Malaya's rubber industry, acting as management agent for 120,000 acres and selling directly from its own holdings. This century-old British house is among the leaders of quality rubber and rubber latex and is a recognized producer of extremely high-grade sole crepe. . . . . The firm recently completed construction in Malaya of a large bulking plant and special docking facilities to facilitate the tanker shipments of latex to America and Europe. This bulking plant will provide facilities for the centrifuging, chemical control, and grading of latex.

"Just what they need!"

What this mill needs is not more drier rolls or more steam to heat them. It needs Hamilton Felts at the wet end of the machines. The eyes of the super will sparkle when he sees how much more water they remove at the presses—how much faster he can run them—how much more tonnage per day—how few ends—how little broke!

And his costs will come down faster than I can slide down the smoke stack.

Merry Christmas and Happy New Year

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

Hamilton Felts

Established 1858

NSRB Seeks Paper Industry's Guidance

WASHINGTON — On invitation from J. D. Mylrea, director of the NSRB's Forest Products Division, a meeting of an initial task group from the pulp, paper and paperboard industry was held here December 1-2 with the following industry representatives:

R. W. Hovey, vice-president, Oxford Paper Co.; Walter H. Wilcox, S. D. Warren Co.; Grant Richardson, assistant vice-president, Hammermill Paper Co.; D. C. Everest, president, Marathon Corp.; J. L. Madden, president, Hollingsworth & Whitney Co.; Robert Evans, Riegel Paper Corp.; L. K. Larson, sales manager, Weyerhaeuser Timber Co.; George E. Dyke, president, Robert Gair Co., Inc.; W. Irving Osborne, Jr., president, Cornell Wood Products Co.; Cola G. Parker, president, Kimberly-Clark Corp.; A. G. Wakeman, vice-president and general manager, Coosa River Newsprint Co.; and E. W. Tinker, executive secretary, American Paper & Pulp Ass'n. Chairman of the meeting was Oliver M. Porter, chief of the NSRB's Pulp, Paper & Paperboard Branch.

Purpose of the meeting was to obtain advice from industry leaders, most of whom served in executive capacities in the War Production Board and other government agencies during World War II, on how best to organize the pulp, paper and paperboard industry for its most effective mobilization under the defense planning of the National Security Resources Board.

Other topics discussed at this meeting covered bottlenecks to be expected in the industry's operations in the event of another war, including shortages in manpower, pulpwood, waste paper transportation, logging equipment, maintenance and repair materials, fuel, chemicals, etc.

The meeting resulted in various recommendations to the NSRB in reference to continental and hemispheric self-sufficiency, in the event of war, as regards manpower, logs and pulpwood, wood pulp, newsprint, and other papers and paperboard and their converted products.

Other recommendations covered personnel for a representative over-all industry advisory committee, and various task groups to study former WPB control orders affecting the industry's operations during World War II with the view of adapting them to such conditions of operation and requirements of manpower, pulpwood, wood pulp, transportation, machinery and equipment, etc., as might be expected during another war.

The NSRB's Pulp, Paper and Paperboard Branch announced its intention of appointing such other task groups as might be necessary to cover all of the principal divisions and products of the industry, including paper merchants and allied industries.

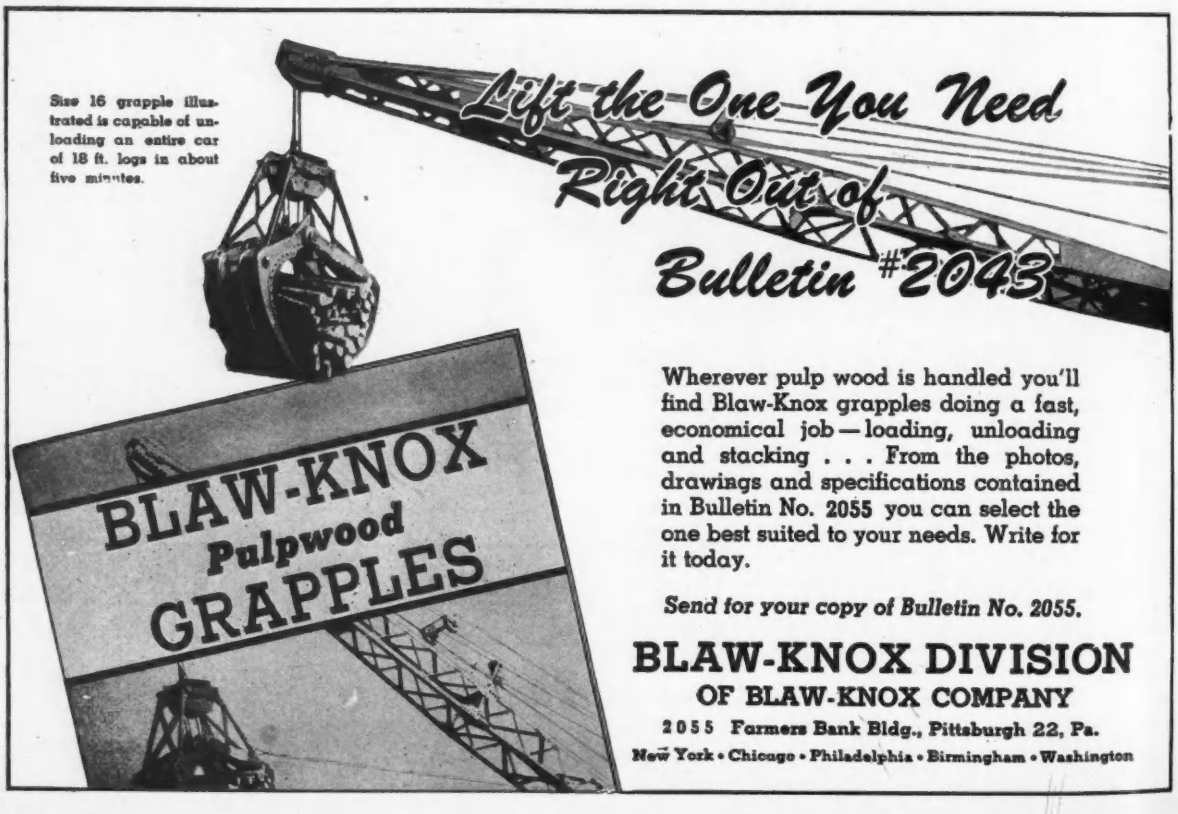
Plans were formulated for an initial survey of the industry's requirements as regards steel, copper, chemicals, fuel, power, wires, felts, and other operating and repair equipment, etc., in order to obtain current information for the preparation of a comprehensive mobilization plan for the industry.

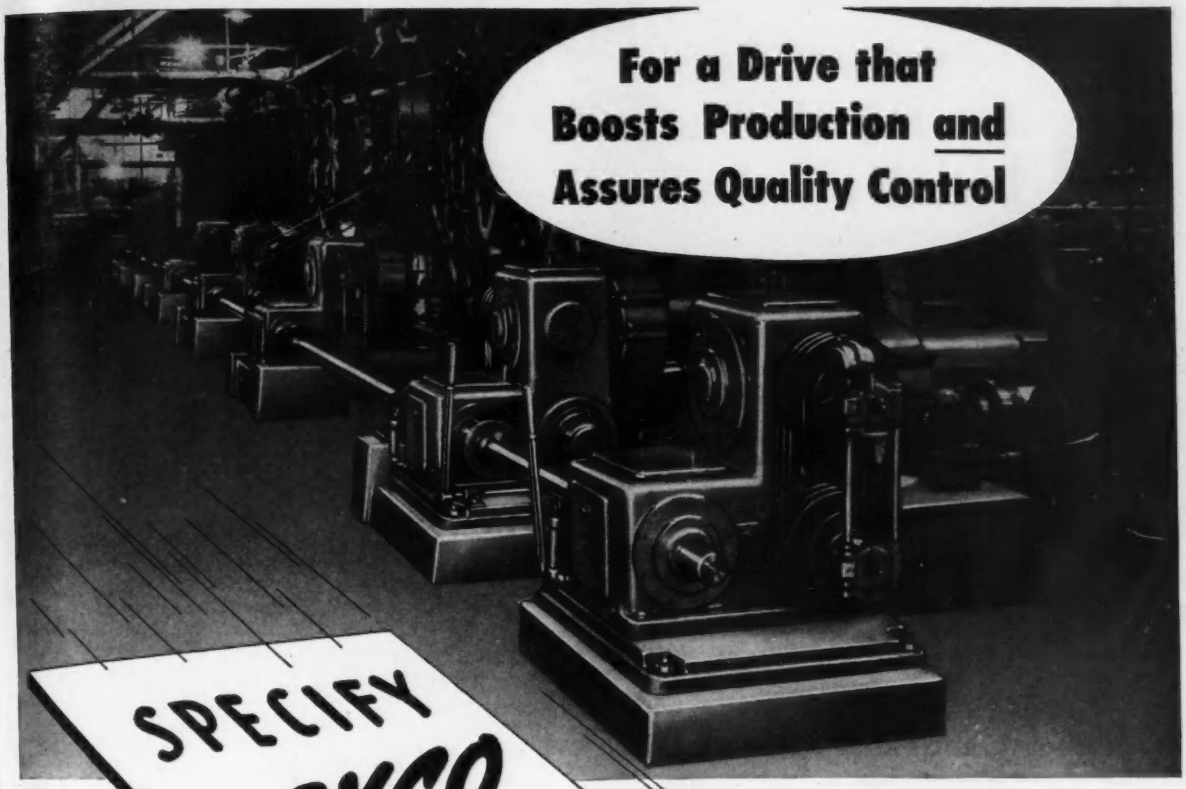
Notes Placed Privately

CHICAGO—Kidder, Peabody & Co., reports to *Paper Trade Journal* that it has placed privately for the Bermingham & Prosser Co. $750,000 of 3¼ percent promissory notes with a final maturity of 15 years. The loan agreement provides for an additional $250,000 long-term financing under certain conditions in the event that the company desires additional financing. Part of the proceeds will be used to retire bank loans and the balance will be added to working capital.

Mersey Shares Offered

LIVERPOOL, N. S.—An offering of 15,000 shares of 4½ percent cumulative redeemable preferred, par $100, of Mersey Paper Co., is being made at $99.50 a share by Royal Securities Corp.


Lift the One You Need
Right Out of
Bulletin #2043
Size 16 grapple illustrated is capable of unloading an entire car of 18 ft. logs in about five minutes.
BLAW-KNOX
Pulpwood
GRAPPLES
Wherever pulp wood is handled you'll find Blaw-Knox grapples doing a fast, economical job — loading, unloading and stacking . . . From the photos, drawings and specifications contained in Bulletin No. 2055 you can select the one best suited to your needs. Write for it today.
Send for your copy of Bulletin No. 2055.
BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2055 Farmers Bank Bldg., Pittsburgh 22, Pa.
New York • Chicago • Philadelphia • Birmingham • Washington



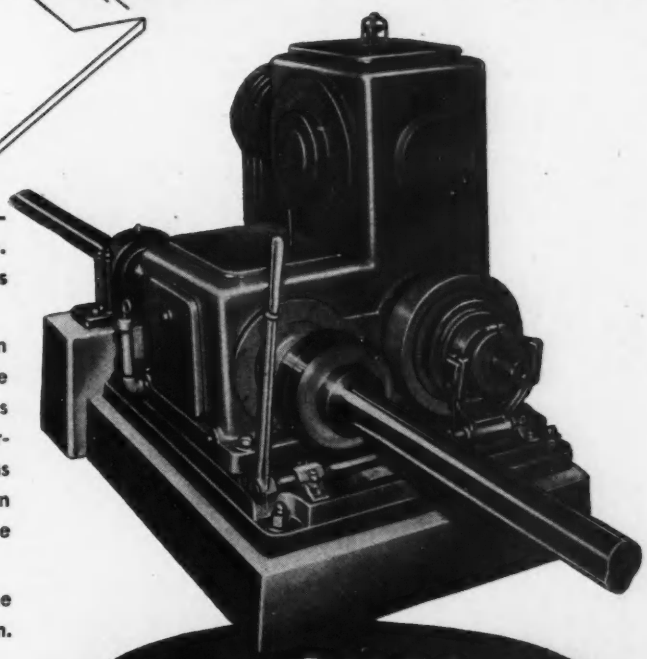
Installation of SYCO Drives has helped to increase paper output on each installation. SYCO contributes to quality control because it is smooth running . . . all the draws stay put.

The precise control mechanism of the modern SYCO Paper Machine Drive facilitates quick, close adjustment of sectional speed . . . then maintains the selected speed without departure. SYCO's interlocking synchronization holds the individual sections in precise speed ratio — preserving uniform tension on the sheet at all times. Breaks are fewer — the machine stays in production with less time out.

SYCO's exact speed control is matched by the ruggedness of its soundly engineered mechanism. SYCO is built for long trouble-free life.

The compact, self-contained modern SYCO drive requires less space, permitting clean, accessible uncluttered space around the machine.

Can the Modern SYCO Paper Machine Drive earn dividends in *your* mill? Write us for full details!



SYCO
MANUFACTURING CORPORATION
Syracuse, N. Y.

NORTH CAROLINA FORESTRY ASS'N.

Five Timber Farm certificates covering 20,652 acres were presented woodland owners by the North Carolina Forestry Ass'n., at its annual meeting in Raleigh on November 16. . . . R. W. Graeber, extreme left, North Carolina Extension Forester, made the presentation. . . . Those receiving awards are, left to right: Edwin McGee, Purlear, 52 acres; J. Pat Nixon, Surry County, 100 acres, A. B. Hafer, forester for the McNair Investment Co., Laurinburg, 20,000 acres owned by that company; P. N. Taylor, White Plains, 300 acres; and James M. Spear, near Boonville, 200 acres owned by the A. S. Spear estate.

Preparedness Plan

NEW YORK — Plans to prepare the pulp and paper industry for "overnight" adaptation to a war economy were to be brought into definite form at a meeting of industry and National Security Resources Board representatives on December 1, details of which did not come to *Paper Trade Journal* in time for this issue.

The preparedness controls are expected to be "stiffer" than those applied to the industry in World War II, said E. W. Tinker, executive secretary of the American Paper & Pulp Ass'n. As projected, the controls would, in an emergency, bring a sudden and drastic cut in the amount of paper manufactured for civilian and commercial use. Demands of other war industries would create a shortage of labor, particularly in pulp production, Mr. Tinker noted.

A part of the meeting was also devoted to considering ways by which the industry can speedily provide personnel for administration of the controls.

Sees Southern Pine Threat

MACON, Ga.—Officials of the Macon Kraft Paper Co. have informed Solicitor General Charles H. Garrett that adoption of a method of reclaiming waste effluent in the making of paper, similar to the system used in the State of Washington, would result in entire reconstruction of the Macon plant and the abandonment of the use of southern pine for pulpwood.

Solicitor Garrett said the officials, however, "assured me that not only did they intend to comply with a court order banning the dumping of toxic effluent into the Ocmulgee river, but that they were building a settling basin at the plant in which the toxic fluid would be poured."

AMYLIQ

AN ENZYME PRODUCT FOR PREPARING
TUB SIZINGS & COATINGS FROM STARCH

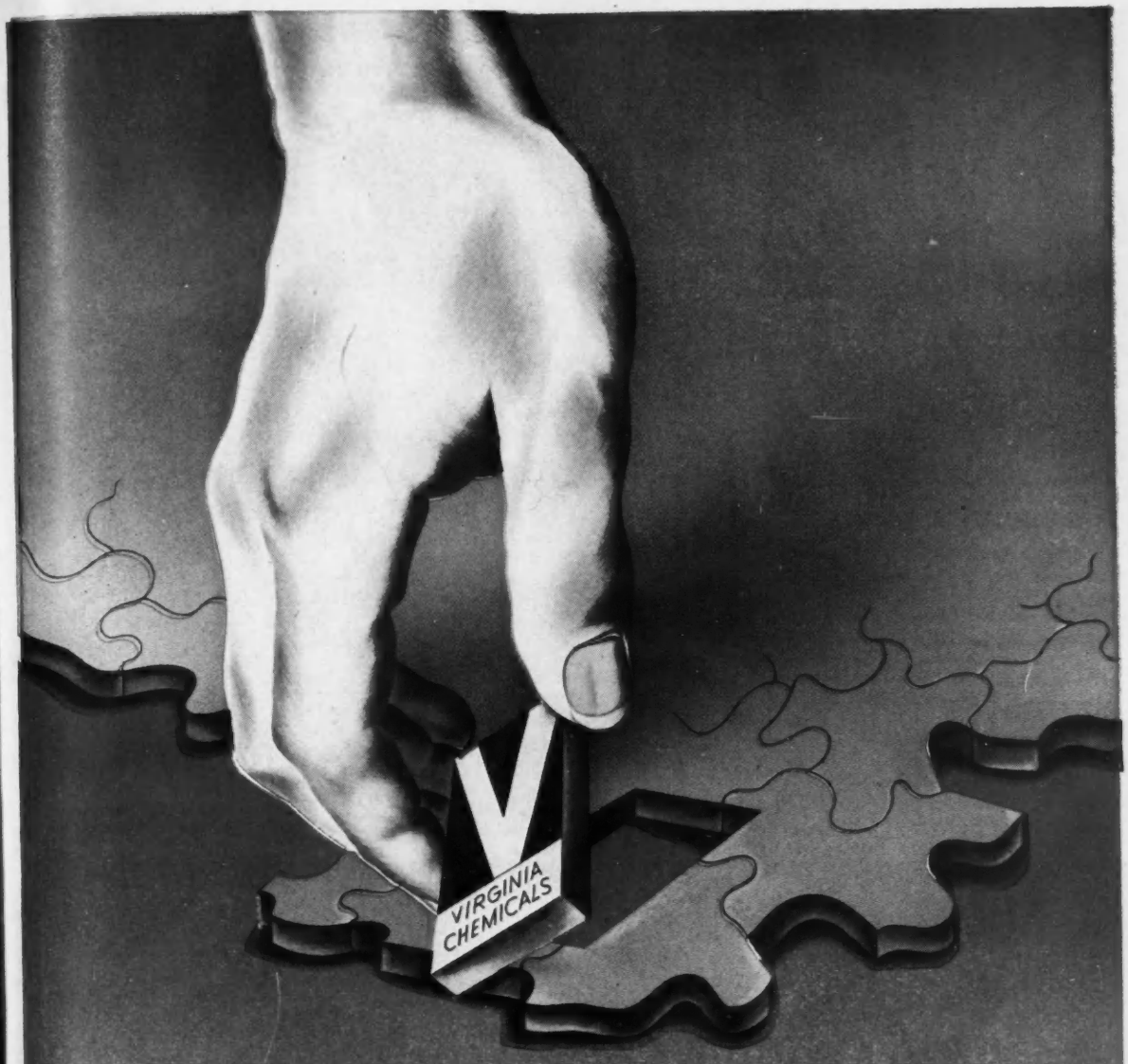
Suitable for all types of tub sizing and coating

•

Maximum flexibility over a wide range of viscosities and solids

AMYLIQ-MODIFIED STARCH COSTS LESS

WALLERSTEIN COMPANY, INC. • 180 MADISON AVENUE, NEW YORK 16, N.Y.



our know-how fits your problems

For 50 years, users of industrial chemicals here and abroad have looked to "Virginia" for products of uniform purity and excellence. More, they have relied heavily upon "Virginia's" versatile engineering staff for research and consultation in the perfecting of their products and processes. This technical cooperation is freely available to you. "Virginia's" vast experience, teamed with your own specialized knowledge, will find a ready answer to your problems.

"Virginia" Zinc Hydrosulphite (ZnS_2O_4) is *high test*. It is expressly prepared as a brightening and decolorizing reagent for the pulp and paper industry. Send for our folder on "Virginia" Zinc Hydrosulphite today. VIRGINIA SMELTING COMPANY, West Norfolk 3, Virginia.

V VIRGINIA *Chemicals*

NEW YORK • BOSTON • DETROIT

50 YEARS OF SERVICE TO INDUSTRY

THINNEST PAPER

The Stevens Paper Mills, Inc., Westfield, Mass., and the Crocker-Burbank Co., are named by the General Electric Co., as its sources of what is believed to be the world's thinnest paper, used in electric capacitors. . . . In the picture, Miss Judy Peterson, a G-E secretary, is shown comparing 200 sheets of the paper with an equal number of sheets of ordinary bond paper. . . . Only .2 of a mil thick, nearly 5,000 sheets of this paper are required to make a stack an inch high. . . . . Capacitor paper is used as insulation in electrical devices to store electric current temporarily.

AMERICAN PAPER AND PULP ASSOCIATION'S PRODUCTION RATIO REPORT*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1948		Corresponding Weeks—1947	
October 23	98.7	October 25	110.2
October 30	99.3	November 1	111.1
November 6	97.0	November 8	108.9
November 13	99.6	November 15	109.1
November 20 (Revised)	99.4	November 22	111.9
November 27	**94.0	November 29	107.4

COMPARATIVE MONTHLY SUMMARIES

1947						1948	
Jan.	102.1	May	106.2	Oct	109.5	Jan.	100.3
Feb.	105.9	June	106.2	Nov.	109.3	Feb.	99.8
Mar.	106.1	July	95.5	Dec.	101.5	Mar.	100.8
Apr.	105.1	Aug.	104.2			Apr.	100.8
		Sept.	102.0	Year Avg.	104.3	May	100.5
						June	95.7
						July	‡88.1
						Aug.	‡96.8
						Sept.	‡91.8
						Oct.	‡99.1

‡ Preliminary Ratios.

COMPARATIVE YEARLY SUMMARIES

	1941	1942	1943	1944	1945	1946	1947	1948
Year to Date	97.4	91.3	88.5	88.7	89.8	101.6	104.6	97.2
Year Average	97.4	90.4	87.8	88.1	89.4	101.1	104.3	

** Indicates 1948 volume of 169,313 tons—Comparable week 1947—170,211 tons.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1948		Corresponding Weeks—1947	
October 23	95	October 25	101
October 30	96	November 1	100
November 6	95	November 8	102
November 13	96	November 15	101
November 20	97	November 22	102
November 27	89	November 29	100

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1947	99	103	101	100	101	101	90	99	96	101	99	89	98
1948	99	100	102	102	100	94	81	92	91	94			

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Lyddon and Company (America) Inc.

•

Exporters of wood pulp to all the world

10 EAST 40TH STREET, NEW YORK 16. N. Y.

Parsons and Whittemore, Inc.

World-Wide Paper Exporters

•

Wood Pulp

PULP • PAPER

LONDON PARIS STOCKHOLM MONTREAL SAO PAULO

OSLO SOUSSE BUENOS AIRES

Only POWELL makes a *complete* line of valves for the PAPER INDUSTRY

More than a hundred years ago Powell adopted a policy. This was to make valves *only* and to make *every kind* of valve that industry might require.

And through the years, strict adherence to this policy has built such a complete line of valves that today there's a Powell Valve for every known industrial flow control service. This includes Bronze and Iron Valves of all required types and designs; Cast Steel Valves of all types in pressure classes from 150 to 2500 pounds; and Corrosion Resistant Valves—including many special designs—made in the widest variety of metals and alloys ever used in making valves.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

Fig. 1893—Flanged end Gate Valve. designed and developed especially for Paper Mill service. Body, bonnet and yoke are cast of 3% Nickel Iron; screwed-in seat rings are 18-8 SMo; solid wedge is made of Ni-resist.

Fig. 1561 — Class 150-pound Cast Steel Swing Check Valve.

Fig. 559 — 125-pound Iron Body Bronze Mounted Swing Check Valve with regrindable, renewable seat and disc. →

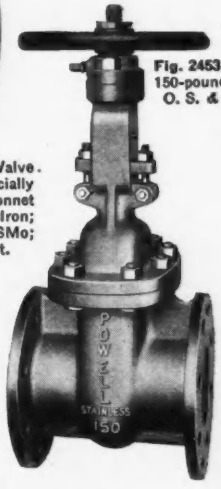


Fig. 2453-G — Standard 150-pound Stainless Steel O. S. & Y. Gate Valve.

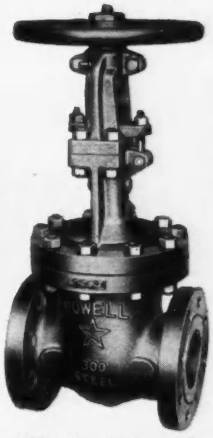
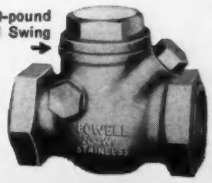


Fig. 3003—Class 300-pound Cast Steel O. S. & Y. Gate Valve.

Fig. 1708 — 200-pound Bronze Globe Valve with renewable stainless steel seat and regrindable renewable "Powellium" nickel-bronze disc.

Fig. 375 — 200-pound Bronze Gate Valve with renewable "Powellium" nickel-bronze disc.

Fig. 1847—200-pound Stainless Steel Swing Check Valve. →



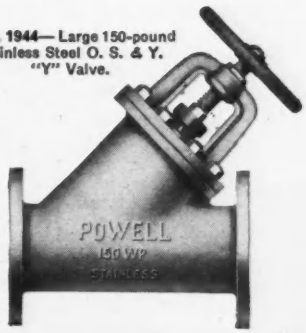


Fig. 1944— Large 150-pound Stainless Steel O. S. & Y. "Y" Valve.

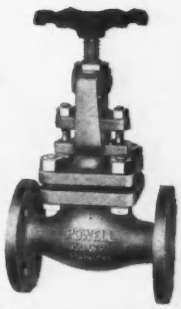


Fig. 1969—150-pound Stainless Steel O. S. & Y. Gate Valve.

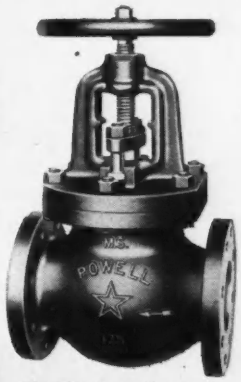


Fig. 241—Large 125-pound Iron Body Bronze Mounted O. S. & Y. Globe Valve.

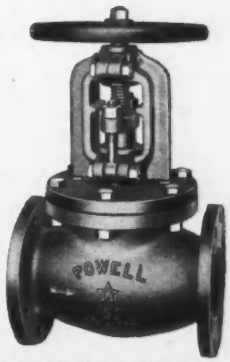


Fig. 2429—150-pound Stainless Steel O. S. & Y. Globe Valve.

POWELL VALVES

Seeks Stockholder's Committee

NEW YORK—Formation of a protective committee of preferred stockholders of Brown Co., paper manufacturer, has been urged by William B. Joyce of William B. Joyce & Sons. Mr. Joyce is chairman of the Brown Co. common stockholders' protective committee.

Mr. Joyce, in a message to preferred stockholders, urged "directors to pay immediately at least $8 per share on preferred stock of which $3 shall be regarded as a regular semi-annual dividend and $5 shall apply to reduction of arrears." Arrears amounted to $54.

Mr. Joyce's message declared: "In 1948 alone, we believe the company will earn around $27 per share on the preferred stock. In seven years (with 1948 estimated at $4 million) total earnings appear in excess of $14,400,000."

FOB Policy

(Continued from page 9)

"Delivery terms in the domestic woodpulp industry," said Mr. Larson, "have historically been subject to change to fit the shifting pattern of a competitive market. Since 75 percent of the pulp sold in the United States prior to the last war was of foreign origin, domestic pulp suppliers have frequently been confronted with necessity of employing selling practices that would enable them to compete with foreign suppliers."

He recalled that not only are wages paid abroad below the U. S. scale for the same work, but woodpulp has been on the tariff free list since 1913, and also cited certain Government activities abroad in aid of their woodpulp exports which he said placed the domestic producer at a disadvantage.

"There are no restrictions on delivery terms that a foreign supplier may quote on woodpulp offered for sale in this market," the witness continued. "Equality of opportunity in his own market is denied the domestic producer if he is precluded from freely meeting the terms and conditions of sale of the foreigner."

Because pulp mills must be located at or near the source of raw material, he said, f.o.b. mill pricing, which the Federal Trade Commission witnesses earlier had said is the only "safe" method today, is "impractical."

"It is our studied opinion," Mr. Larson told the committee, "that individual pulp producers must be permitted to adopt such systematic pricing methods as domestic markets may from time to time require."

Another paper company executive, John E. Massengale, vice-president in charge of sales for Eastern Corp., Bangor, Me., summed up his company's position when he said, "Our mills cannot be moved to market."

Declaring that the subject of pricing policies is of the utmost concern to his company, Mr. Massengale added:

"In fact, the final decision reached may well mean to us the difference between survival and, to put it bluntly, bankruptcy."

Warning against change in pricing methods, affecting the company's competitive situation, Mr. Massengale said:

"Closing of our plants would work irremediable hardship on our communities as there are no actual or potential industries to replace us."

He pointed out that "we sell to paper merchants who stock and distribute our products in Portland, Me., Seattle, Wash., Miami, Fla., Los Angeles, Calif., and many places between these boundaries."

At a FTC hearing in New York City at approximately the same time hopes for a continuance of their traditional pricing policy by the paper industry were shaken when investigators from the Federal Trade Commission invaded the Chanin building, the home of most of the paper trade associations located in this area.

According to Robert Canfield of Wise, Corlett and Canfield, counsel for the American Paper & Pulp Ass'n., and several divisional associations, the FTC is conducting an investigation to see whether or not the various paper trade

associations have taken collective action with reference to prices.

The investigation is said to involve most of the member associations of APPA, except the Book Paper Mfr's. Ass'n., the latter association being exempt because the FTC feels it already has enough information on the book paper group gathered in a previous investigation.

The FTC has requested all correspondence of the associations since May 27, 1935, and no liimt has been set on any other data which the FTC may request during the course of their investigation.

In a statement on behalf of the paper and wood pulp industry as represented by the APPA before the Senate Subcommittee on Trade Policies in Washington, the core of the problem, insofar as the effects of an f.o.b. mill price system are concerned were briefly as follows:

1. There are a number of different methods of selling now prevailing in the industry. The known methods range from f.o.b mill selling (in a few instances, usually where the freight is low in relation to the high selling cost of the item) to individual systems used by the individual manufacturers which result in a substantial or complete absorption of freight by the mill.

Most Common Method

Probably the most common method of selling is f.o.b. mil with the lowest carload rate of freight allowed to any destination in a given zone. Because of the varying zone upcharges, mill base prices vary somewhat as to different zones. A variant of this method is the practice of selling f.o.b. mill with allowance of actual freight up to a fixed amount which differs as between various sellers.

Therefore, a forced adoption of uniform f.o.b. mill pricing would require the elimination of these and other forms of selling which have developed as a direct result of competitive forces and of the necesity to reach many markets in order to secure volume production.

F.o.b. mill selling in the concept of the FTC, according to the report, envisions a manufacturer close to the customer or vice-versa. However, most mills are located far from the consuming areas and must remain so located since there do not exist enough location sites on water, near forests and near consuming areas to permit such relocation.

Major Marketing Areas

Paper, however, is consumed in the populated areas and, therefore, consuming areas are generally remote from paper mills. Furthermore, major marketing areas are at varying distances from any given mill location.

The following recommendation is strongly urged as the considered statement of small, medium and large manu-

(Continued on page 54)

READY to Do These Jobs in Your Mill—WELL

1 Handle coating materials

2 Handle sizing materials

3 Handle lime mud

This is the diaphragm slurry pump that is doing an excellent job in chemical plants. It has excellent efficiency. But more than that, it offers great economy because of its durability and low maintenance. The diaphragm, for instance, is activated solely by vacuum, pressure or a combination of both. There is no mechanical linkage. And there are no weakening center or circumferential holes punched in it. There are no motor, stuffing box, packing or high-speed moving parts. Flows can be "cycled" or proportioned. Several sizes of pumps from 1 to 3 inches are available.

Write for Bulletin 309. It gives full details.
SHIPMENT FROM EASTERN OR WESTERN FACTORY!

OLIVER UNITED FILTERS INC.

New York 18, N. Y.
33 West 42nd Street

San Francisco 11
California

Sales & Manufacturing Representative:
E. Long Limited
Orillia, Canada

Chicago 1, Ill.
221 N. LaSalle Street

Western Sales Division
Oakland 1, Calif.
2900 Glascock Street

Factories: Oakland, Calif. • Hazleton, Pa. • Orillia, Canada • Melbourne, Australia

FOB Policy

(Continued from page 53)

facturers of a variety of papers all needed in the everyday life of this country, paper spokesmen said:

"It is recommended that because of recent court decisions and interpretations of existing laws such laws be so clarified as to permit freedom of action by any individual manufacturer to sell his product on the basis that best suits his competitive needs and that the general adoption, without collusion, of any system of selling by manufacturers of paper shall not be in violation of any such laws.

"Executives of the paper industry generally do not want and believe it is not in the best interests of the industry and the country to have one system and one system only of selling. The paper industry desires fredom of action to sell in the open market on that basis which best meets its competitive needs."

At the Washington hearing, Robert D. Pike, consulting chemical engineer, of Stamford, Conn., pointed out effects such a change would have on the soda ash plant projected for construction at Westvaco, Wyo., utilizing vast trona deposits in that area.

"Discovery of the Wyoming trona is of first importance to the chemical industry," the witness told the hearing.

Distribution of Soda Ash Consumption by Industry

Consuming Industries	1945	1946	1947
Glass	1,320,000	1,400,000	1,440,000
Soap	150,000	120,000	135,000
Caustic and bicarbonate	1,114,000	1,128,000	1,130,000
All other chemicals	960,000	910,000	1,030,000
Cleansers & Modified sodas	110,000	125,000	130,000
Pulp and paper	175,000	190,000	220,000
Water softeners	100,000	90,000	100,000
Petroleum refining	24,000	20,000	22,000
Textiles	68,000	77,000	71,000
Non-ferrous metals	200,000	140,000	190,000
Exports	70,000	67,000	92,000
Miscellaneous	290,000	223,000	240,000
Totals	4,581,000	4,490,000	4,800,000

The density of consumption of soda ash per unit area, follows the density of population and industry. The greater part of the production is by the ammonia soda process, less than 10% of the total being currently produced from natural sources in California. In the ammonia soda process soda ash is made from common salt, limestone and coke and as these materials are available near the large industrial centers and along the Gulf Coast, there has been a great growth of the ammonia soda process at such locations, and the plants have comparatively short distances to ship to the consumers.

In the following Table III is presented a list of the ammonia soda producers and the principal natural soda producer with their plant locations.

"The proven trona is sufficient to supply the entire requirements of the United States for soda ash for over 35 years and the probable reserves are far in excess of this.

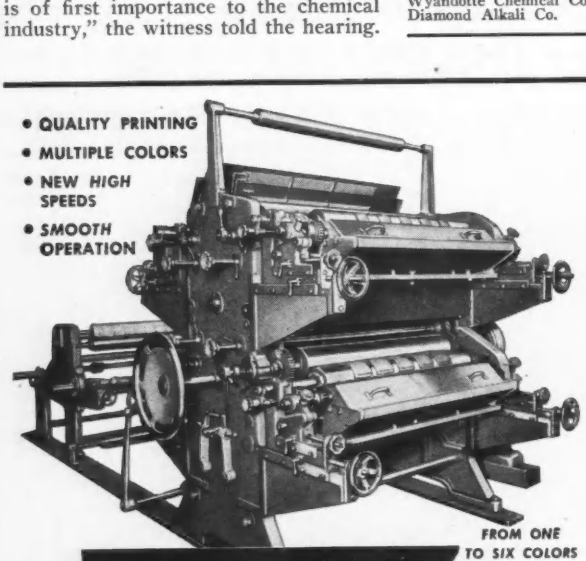
"The trona being located in a district remote from large consumers of soda ash, the product must be shipped long distances to markets, as compared with ammonia soda ash manufacturers. The economic importance of the trona deposits must, therefore, derive principally from the relatively pure state of the trona and the comparative ease of manufacture of marketable grades of soda ash therefrom. The cost of manufacture at Westvaco must be materially lower at the factory than in the ammonia soda ash plants which are closer to the large consuming centers."

The witness entered into the record the accompanying table bearing on distribution of soda ash consumption by industries, and locations of soda ash plants in the United States.

Locations of Soda Ash Production

Company	Location
Solvay Process Co., subsidiary,	Syracuse, N. Y.
Allied Chemical & Dye Corp.	Baton Rouge, La.
	Detroit, Mich.
Wyandotte Chemical Co.	Detroit, Mich.
Diamond Alkali Co.	Painesville, Ohio

• QUALITY PRINTING
• MULTIPLE COLORS
• NEW HIGH SPEEDS
• SMOOTH OPERATION



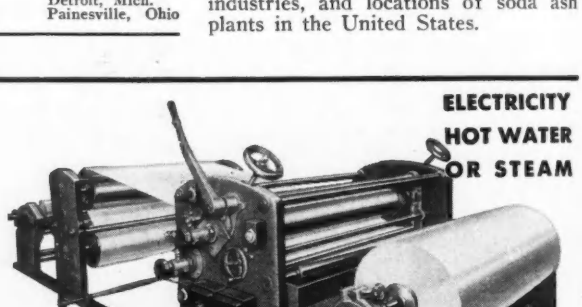
FROM ONE TO SIX COLORS

ANILINE PRESSES

New designs and new presses to meet every production demand. Widths from 10 to 100 inches with from one to six color printing. Illustrated, is 4 color stack type press with center shaft rewind. Many other models now available. Write for further information.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

ELECTRICITY
HOT WATER
OR STEAM



MODEL AW-2L

WET WAXING UP TO 80" WIDE

A new model Wet Waxer . . . featuring compact construction, functional flexibility of use, high speed, and electric, hot water or steam heating. Built in widths from 10 to 80 inches. Other models available for dry or contact waxing. Write for further information.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

SECTION OF THE

TECHNICAL ASSOCIATION
OF THE PULP AND PAPER INDUSTRY

122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

The Application of a Flocculation Type Unit in Paper Mill White Water Treatment*

By J. M. Kahn[1]

Abstract

A unit recently installed in a 200-ton two machine mill manufacturing liner board is performing double duties by reducing stream pollution and recovering approximately 4.2 tons of fiber per day. The white water contains about 3 pounds suspended solids and after treatment with alum and activated silica the 5-day B.O.D. is reduced 59% along with removal of 94% of suspended solids. The fibers are concentrated within the unit and discharged for reuse at a consistency of 1%. The entire operations are virtually automatic with a weir operated meter proprtioning the chemicals according to yow of white water and regulating the discharge of fibers and fillers from the unit so as to maintain a uniform consistency.

The Cyclator is a precipitation type unit for white water treatment and is so designed that chemical reactions take place under controlled conditions. These conditions provide for recirculation of previously treated white water along with slurry so that coagulation of the suspended solids takes place in the presence of previously formed yoc. The individual particle size of precipitate is materially increased by this procedure so that rapid and complete separation of clarified white water and fiber and filler is attained. The precipitated solids are collected and concentrated by revolving scrapers as they are moved to the collection sump for discharge.

TABLE I.—VARIATIONS IN B.O.D.'S IN WASTE FROM THE SAME MILL

Date	Suspended Solids, p.p.m.	B.O.D., p.p.m.	Date	Suspended Solids, p.p.m.	B.O.D., p.p.m.	Date	Hour	Suspended Solids, p.p.m.	B.O.D., p.p.m.
Feb.	1184	1130	May	704	393	Feb./28	0600	392	260
Mar.	660	853	July	596	245	Feb./28	0700	256	225
Aug.	756	960	Aug.	750	228	Feb./28	0800	246	241

The reasons for and the benefits derived from treatment of papermill white water have been widely discussed so that the basic factors are well recognized. The ever increasing public pressure on the subject of stream pollution, be it in the form of legislation or community interest, threatens to make treatment of white water a must even though the cost incurred will be an additional operating expense. Chemical treatment of white water is of interest since it will result in reducing pollution to a satisfactory limit by recovering for reuse or disposal the suspended solids, namely fibers and fillers.

Experience has taught that numerous variables exist in the average white water and that any successful installation must necessarily be flexible in operation to meet these varying conditions. Illustrating these variables Table I lists the changes in white water composition from the same board mill which show variations not only during an operating month, but also during hours of an operating day:

These variables are not limited to chemical characteristics which influence coagulating ability of chemicals, but also include physical characteristics as well. Under certain operating conditions fibers have a tendency to float because of entrained air which is either entrapped mechanically as the white water falls to the pit from the showers, wires, or cylinders, or liberated due to the temperature rise of the white water being recirculated. The settling characteristics after coagulation also varies because of differences in filler content, to say nothing of variations that occur due to changes in grade of paper or sizing operations. Momentary temperature fluctuations also have a direct bearing on white water treatment. In view of the above, a treating plant to operate properly must necessarily be flexible, and must provide for the variable characteristics in the white water undergoing treatment.

Plain sedimentation type white water treating units inherently cannot handle floating fibers and operating difficulties due to temperature variations materially upsets operation to a point where wide variations in characteristics of effluent occur. While chemical treatment aids in sedimentation and allows the use of a smaller tank, this in itself does not obviate these shortcomings. Furthermore, fibers should be concentrated to allow for economical reuse, the concentrations attainable being a

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948

[1] Member TAPPI; Field Eng., Infilco, Inc., Chicago, Ill.

function of time thickening by scrappers and also on the environment in which the precipitate is formed. The changing of colors or short runs on "specials" does not make for the best operating conditions in any type of white water treatment. Floatation units of the pressure or vacuum type, are not too readily adjustable to meet varying operating conditions and find difficulty when handling a white water in which a filler content is high as floating a granular precipitate may be very difficult if not impossible. The suspended solids content of the effluent of most floatation units at best is on the order of ½ pound per 1000 gallons of white water, which is equivalent to only 85% removal when handling a white water having a suspended solids content of 3 pounds per 1000 gallons. Certain requirements demand the removal of approximately 95% suspended solids content, in view of the relationship between suspended solids content and B.O.D. reductions.

Operation of Unit

The Cyclator (Fig. 1) was designed with the above outlined background in mind and with the thought of coping with most of these variables. Provisions are made so that the chemical reaction produces compact and dense precipitates which upon collection are further dewatered mechanically as they are moved towards the sump for discharge. The airbound fibers are separated and mechanical means for releasing the entrained air is provided so that they eventually become a part of the slurry. Coagulating chemicals are readily adjustable and are automatically proportioned in accordance with the variation in flow of white water. The discharge of recovered fibers which have been concentrated is also controlled in proportion to the flow of white water so that their consistency remains constant. Although sudden changes in temperature are equalized by dilution with the circulating slurry, the effects of convection currents are detrimental to good operation and precaution must be taken to avoid excessive temperature changes.

The white water enters the primary mixing zone where the coagulating chemical, usually alum, is applied. Under certain operating conditions there may be sufficient free alum in the white water resulting from sizing operations to obviate its use, while under other conditions additional alum must be added. By the same token, when sizing operations are not practiced, sufficient coagulant must be added to meet the demand. Excessive dosages are quite detrimental because a more voluminous floce is produced which is hard to dewater and reduces concentration of the recovered fibers. The reaction between the coagulant and the white water takes place in the presence of treated white water containing a slurry of previously formed precipitates. By this procedure the newly formed precipitates adhere to the previously formed particles present thereby increasing the size, density, and rate at which the solids may be separated from the water.

The ratio between water undergoing treatment and recycled white water slurry is readily adjustable by means of the variable speed drive circulator. Under normal conditions, it has been found that a recycling of at least two volumes of previously treated liquid gives best results. The circulator, which in reality is a large capacity, low head pump, discharges the entire slurry into the circulating zones. A coagulant aid is applied to the slurry in the primary circulating zone and is dispersed by means of the circulator as comparatively high mixing velocities are required to obtain the maximum effectiveness. It has been found that activated silica is a very effective aid in that the precipitate formed by its use is made more compact which allows for more complete separation of clarified white water from fibers.

The circulating zone is divided into inner and outer zones, the flow in the inner being upward while the flow in the outer is downward. This provides a collecting space for the "airbound" particles that tend to float as they are entrapped in the upper part of the circulating zone. The floating particles may be gently agitated by a rotating arm thus to free them of entrained air. Also the flow of water from the inner to the outer circulating zones creates sufficient turbulence to assist in freeing the entrained air. The flow from the outer circulating zone is downward into the clarified liquor and at a point approximately half the liquid depth. The precipitates continue in a downward path and settle to the floor of the unit while the clarified white water turns upward on its way to decanting by means of a peripheral weir. The lighter or slower settling precipitates are drawn back into the mixing zone to aid in the formation of new precipitates and thus increase in size and density. Thus only the through-put flows upward and is collected by means of the peripheral weir.

The precipitated fibers along with the fillers are further dewatered by mechanical scrapers which continually move them toward the collection sump from which they are discharged. This mechanical movement of precipitates serves as an efficient means of dewatering and obtaining a high consistency for the fibers as discharged. Experience indicates that this type of equipment is capable of recovering fibers without appreciable filler at a consistency of 1% which seems to be the practical high limit for equipment of this type. At present, additional studies are under way and methods are being investigated in the hopes that the consistency of the recovered

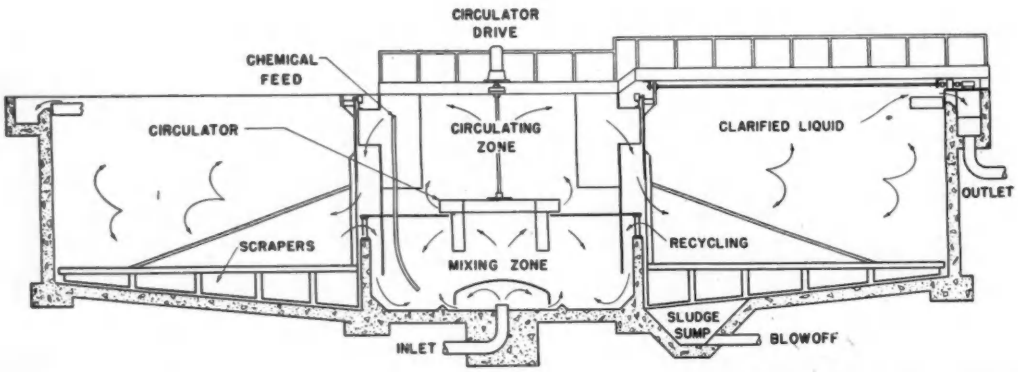


FIG. 1

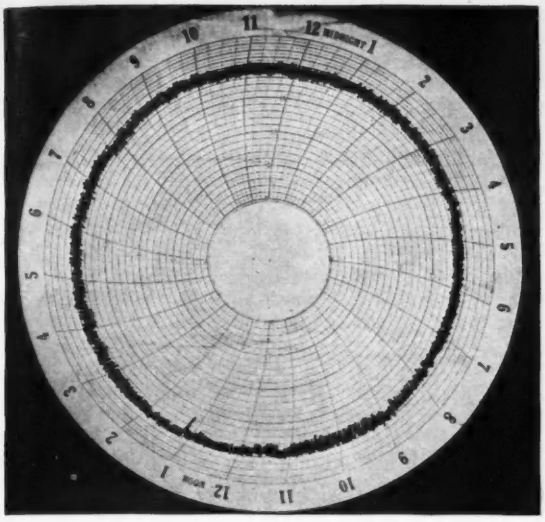


FIG. 2

fibers may be increased from 3 to 5% by additional dewatering means.

The clarified white water is metered after it has been collected by means of a weir operated electrical meter which incorporates electrical controls which operate the chemical feeding equipment as well as the discharge for concentrated fibers. By this one control the entire operations are kept in proportion to the volume of white water undergoing treatment and this control insures a uniform consistency of recovered fibers be obtained. Entire operations are recorded, usually on a 24-hour chart (Fig. 2), which chart indicates not only the volume of white water undergoing treatment, but also the volume and time interval of recoverer fibers as discharged.

Mill Results

A unit was recently placed in service by the River Raisin Paper Co., at Monroe, Mich., for use in treating white water from two seven-cylinder machines making approximately 200 ton of liner board per day. This unit is designed to handle a flow of 2100 g. p. m. and as is operating at approximately 2,000 g. p. m. Composite samples over a typical 8-hour operating day show the suspended solids content of the white water undergoing treatment averaged 540 p. p. m. (4.5 pounds per thousand gallons) with a color in excess of 250 and a 5-day B. O. D. demand of 128 p.p.m. The composite sample effluent showed a suspended solids content of 31 p.p.m. (0.25 pound per thousand gallons), color of 28, 5-day B. O. D. demand of 62 p. p. m. The above results indicate a suspended solids removal on the order of 95% and a B. O. D. reduction on the order of 50%. The sump discharge showed a suspended solids content of 10,570 p. p. m., slightly in excess of 1% by weight, and recovered fibers are reused in the process at this consistency. The chemical dosages vary considerably from a minimum of approximately 2 grains of alum when paper is sized to approximately 11 grains per gallon of alum when no size is used. In addition, 10 p. p. m. of activated silica is added continuously, and is added directly to the primary circulating zone. The completed installation costs, which include piping, housing, booster pumps, Cyclator, and chemical buildings with feeders, was approximately $60,000.00, and because of the necessity for pumping the white water to approximately 50 foot elevation, the total horsepower required for all operations is approximately 65. The connected load required for operation of the unit along with chemical feeds and auxiliary is approximately 5 hp. At present entire operations are supervised by one 8-hour operator and certain changes are contemplated in the hopes of minimizing operating personnel. The entire operations may be classified as no cost as approximately 4.25 pounds of stock per 1,000 gallons is being reused which at a value of $20.00 per ton results in a credit approximately $122.00 per day. The estimated operating expenses are tabulated below:

Energy connected load, 65 hp. at $90.00 per hp. per year	$18.00
Chemical cost average, 10 grains per gallon of alum at $1.20 per 100	48.00
Ten parts per million activated silica No. 820 41° Be at 90c per 100	7.40
Fifty-two pounds concentrated sulphuric acid at 2c per pound	1.04
Labor per day	15.00
Ten per cent depreciation and maintenance, etc., per day	20.60
Total operating cost	$109.44

The Relationship of Stock Preparation to the Formation of Sulphite Papers*

By T. M. Barry[1]

Abstract

A practical approach to the subject is presented. Stock may be partially prepared in the digester and during the bleaching process as well as by mechanical means. Reference is made to the relationship of the various types of treatment to paper formation and methods of control are indicated.

In approaching the subject from a practical angle the term "stock preparation" is considered to refer to the mechanical treatment of the raw stock as well as to the treatment which takes place in the digester or during the bleaching process, whereby the physical as well as the chemical nature of the fiber is altered. "Formation" is a term which describes the distribution of the fibers in a sheet of paper as judged by transmitted light.

Sulphite papers have a multitude of uses and when developing a sheet for a particular purpose, individual characteristics such as, formation, bulk, finish, strength

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

[1] Member TAPPI; Mill Manager, Fraser Paper, Ltd., Madawaska, Me.

(bursting and tearing), porosity, flexibility, rigidity, surface hardness and uniformity, dimensional stability, opacity, transparency, and folding properties should be taken into consideration so that the extent and type of stock preparation required may then be determined.

The author's observations are confined to sulphite papers made from softwood pulp and which have been produced on a fourdrinier machine.

All will probably agree that the quality of the sulphite pulp made by the average mill today does vary. Some pulps, by their very nature, require a substantial amount of treatment before they can be formed satisfactorily on the paper machine, while some will require only a medium treatment, and still others may need comparatively little. Hard rigid types of raw fiber have to be properly treated before a uniformly formed sheet can be produced. Thus, generally speaking, unbleached fibers which are harder and freer acting than bleached fibers require more treatment. Then, too, certain papers like glassine, for example, requires considerable fiber treatment, whereas lightweight soft tissues are made from stock which receives little mechanical treatment.

In between these two extremes there are a host of grades which demand more or less stock preparation depending upon the original quality of the pulp and the use requirement of the paper.

Stock may be and is prepared chemically as well as mechanically, although usually the term stock preparation is considered as being synonymous with mechanical treatment. The degree to which the cellulose fibers has been attacked during the cooking and bleaching processes determines to a large extent the amount of mechanical treatment to which it may be subjected in order to produce the desired sheet characteristics. In other words the resistance of a particular stock to mechanical treatment is apparently dependent to some extent on the nature of the wood from which the pulp was obtained, but mainly on the manner in which it has been handled in the digester and during bleaching.

Some sulphite pulps will withstand considerable harsh treatment during mechanical preparation and develop a sheet possessing high strength while others if subjected to the same treatment will break down and the paper made therefrom will lack the necessary strength.

While certain laboratory tests are made that are helpful to the pulpmaker and the papermaker, there are so many variables involved that the papermaker, based on such information as is made available to him does not know definitely how a certain stock will act until he makes paper from it.

In the author's opinion the foregoing factors should be taken into consideration when discussing the relationship of stock preparation to formation.

Whether the furnish specifications call for the stock to be free or slow, long or short, a uniform formation is usually desirable and it is generally procurable if the proper adjustments are made on the machine. Of course, all know that the sheet made from slow stock has a different look through appearance than a sheet made from free stock although both sheets may possess a uniform formation. It may or may not be necessary to subject the original fiber to mechanical treatment in order to make a uniformly formed sheet, but it is frequently necessary to treat the fibers beyond the point at which a uniform formation can be obtained in order to develop other desired qualities in the paper.

By microscopic inspection and by freeness tests it is found that the fibers can be treated in such a manner that some of them are fibrillated while others are cut, yet the overall freeness has not been reduced much below that of the original stock. On the other hand the same fibers may be subjected to such treatment that practically all of them are attacked either by being cut, fibrillated, or even hydrated, and the freeness of the stock will have dropped appreciably. While the latter stock may be formed properly on the machine, it is generally harder to handle at the presses and also it requires more steam to dry it. This is a very important factor to consider when you are striving for maximum production consistent with the manufacture of quality paper.

Within limitations it its the author's experience that the freer the stock on the wire can be kept and still meet the paper specifications, the better machine operating conditions will result with better production.

To prepare the sulphite fibers mechanically it is customary to employ a combination of beaters, jordans, and/or refiners. The relative efficiency of each type of equipment may depend upon the nature of the stock to be treated, the method of treatment, and the desired amount of treatment. Of course power consumption must be considered.

As to methods for controlling the degree of treatment, freeness or drainage tests, fractionation tests, strength tests on hand sheets, microscopic examination and measurements of the power input per unit of pulp are all helpful, but the final answer is obtained by the way the stock acts on the wire and by consulting the tests taken on the finished paper.

If the ideal formation for a particular grade of paper is considered to be 100%, then it is believed that from 80 to 90% of this is obtainable by paper machine manipulation when making paper from the freer types of stock disregarding any previous chemical treatment. This percentage varies considerably, of course, dependent on the amount of chemical treatment and the grades being made. When making glassine or similar papers from stocks which have been hydrated, mechanical preparation is a predominant factor.

The Inspection Specification as a Quality Contract*

By J. G. Strieby[1]

Abstract

The concepts and methods which have grown out of the applications of statistical methodology to quality system problems provide economic and objective means for observing and describing quality. One of the most useful devices thus made possible is the inspection specification, a quality agreement or contract which states in unambiguous manner the amount and kind of evidence

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26. 1948.

[1] Technical Department, Kimberly-Clark Corp., Neenah, Wis.

accepted as demonstrating that a lot of goods does or does not conform to the agreement. Its approach is realistically factual and its statements are operationally verifiable in terms of sampling systems which provide for both consumer and producer the degree and type of protection compatible with economic considerations. Buying and selling under the terms of inspection specifications is on an enlightened basis not otherwise possible.

Business men have long dealt with each other on a contract basis. As regards quantity of purchased material, price, and method of payment business men, with the aid of the legal profession, have evolved systems of contracts that are marvels of clarity and utility in that they provide objectively enforceable agreements which state definitely the obligations of all parties involved. As regards quality of purchased goods, however, contracts are ,in general, either nonexistent or vague instruments which cannot be interpreted or enforced objectively because their ambiguity or lack of realism precludes any real "meeting of the minds." The "caveat emptor" motto may not apply rigorously to most current practices but the purchaser's best quality assurance is a faith and confidence relationship with a reputable supplier. Even so, it often happens that costs soar and nerves are frayed because of misunderstandings inherent in such lack of system.

This unsatisfactory situation regarding quality contracts exists not because business men and the legal profession desire it, but because they have not discovered a remedy. The obstacle has been the lack of economic and objective means for observing and describing the quality of a lot of goods. The concepts and methods which have grown out of applications of statistical methodology to quality system problems have largely removed this obstacle and provided an instrument, here called the inspection specification, which is capable of putting the quality contract on a basis as firm as that of the price and quantity contract.

The inspection specification is a quality agreement or contract which states in unambiguous manner the amount and kind of evidence accepted as demonstrating that a lot of goods does or does not conform to the agreement. Its approach is realistically factual and its statements are operationally verifiable by means of sampling-inspection systems which provide for both consumer and producer the type and degree of protection compatible with economic consideration. Buying and selling under the terms of inspection specifications is on an enlightened and harmonious basis not otherwise possible *(31)*.

The inspection specification provides a practical basis for quality agreement between a manufacturer and his customer or between a manufacturer and his supplier; for example between a papermaker and a printer or between a papermaker and the supplier of clay or starch. Its utility is not limited to agreements between business concerns. Practical agreements between a pulp mill and paper mill in the same company, between a manufacturing department and a sales department, or between a manufacturing unit and top management are readily made in the form of inspection specifications and will operate with a maximum of light and a minimum of heat.

The inspection specification can be arranged to cover quality characteristics observed as attributes or variables. "Variables" refers to measurements of such characteristics as basis weight, brightness, tensile strength, moisture content, etc. "Attributes" refers to classification such as good or bad, wrinkled or not wrinkled, correct dimensions or incorrect dimensions, and characteristics such as dirt counts, bacteria counts, defects per unit, etc.

Specifications of ideal quality and specifications of design quality should be based on concepts and philosophies very similar to those on which inspection specifications are based. The three types may be very similar in form. However interesting these other specifications may be, a useful discussion of them should be made separately and this discussion will be confined to the inspection specification.

General Nature of Inspection Specifications

In operation the inspection specification is relatively simple. When a lot of goods is received it is sampled, the individuals in the sample are inspected and the sample evidence compared to definite conformance criteria to provide a basis for action on the lot. Preparation and evaluation of a specification may be however, quite involved. In general, a good specification can be prepared only after considerable study of the consumer's needs and producer's product and processes. A minimum of 6 months to 1 year is usually required to accumulate the required information.

The specification is based on sample evidence rather than on inspection of each individual in the lot for any of several valid, practical reasons. The tests or inspections may be destructive. For example, a moisture content determination by oven drying each sheet in a skid of book paper leaves no undamaged sheets to be printed. Or a bursting strength on each sheet of tissue in a container leaves only torn sheets for use. Even though tests and inspections are not destructive, it is often uneconomical to do 100% inspection. For example, it may be much less expensive to discard an occasional printed sheet of paper which contains a grease spot than it is to sort i.e. 100% inspect all sheets prior to printing in order to remove the expected one in ten thousand which contains a grease spot. Not infrequently 100% inspection, due to large amount of handling, actually causes defective material; torn or wrinkled sheets for example. In many cases it has been shown that a sampling plan carefully designed and operated results in more reliable quality information, more intelligent action and, therefore better quality than does a system of 100% inspection. Where 100% inspection is practical and economic, it is often desirable to operate a sampling inspection plan to provide assurance that the 100% inspection operation is at the required level of efficiency.

Whatever the reason for sampling procedure, sampling plans which lead to reliable inference and action are possible only when modern statistical concepts enter into the design of the system. Modern sampling theory and statistical method are synonymous terms. It is only because the modern statistical approach "is a hard boiled, realistic approach and in the best scientific and engineering tradition in that it faces facts, insists on measuring quantities . . . . . and reasons quantitatively" *(28)* that the practical quality contract is now available. The language of the specification may give no clue, except to the expert, of its statistical foundation. Operation of the specification requires no statistical knowledge but preparation and evaluation of the specification require, at least, a working knowledge of elementary statistical methodology.

Any operation based on sampling involves some uncertainty. In the case of the inspection specification, one cannot avoid the risk that a bad lot will yield a good sample or that a good lot will yield a bad sample. These risks run by consumer and producer (discussed in more detail below) may be expressed quantitatively and the sampling plan can be designed to maintain these risks at whatever values are necessary to provide consumer

and producer the required protection.

In addition to providing the amount of protection needed sampling plans may be designed to provide any of several types of protection. The "grand lot" system, originated by Col. Simon *(20)*, provides assurance that the supplier's product is such that each lot is essentially a sample from a grand lot of homogeneous characteristics. When such evidence is lacking, the doubtful lot may be subjected to further inspection or other action may be taken as specified. The average outgoing quality limit (A.O.Q.L.) type of system *(5)* provides assurance that the long term average quality of goods after the inspection operation will not exceed some limiting value. Sorting of all nonconforming lots is required in this system. The lot quality type of system *(5)* provides protection against the individual bad lot without regard for other lots in the general flow of material.

Each of these types of protection may be arranged to provide a wide range of risks i.e. degrees of protection by means of any of several kinds of sampling plans. A "single sampling plan" *(5)* provides that one sample consisting of a specified number of individuals be taken from the lot, the sample inspected and the sample evidence used to decide that the lot conforms or does not conform. A "double sampling plan" *(5)* provides that a first sample consisting of a specified number of individuals be taken from the lot and inspected. Evidence from the first sample leads to one of three decisions, (a) the lot conforms, (b) the lot does not conform or (c) a second sample consisting of a specified number of individuals shall be taken and inspected. In the latter case, evidence from the combined first and second samples is used to decide that the lot does or does not conform. A "sequential sampling plan" *(10)* provides that a first sample consisting of a specified number of individuals be taken from the lot and inspected. The sample evidence leads to one of three decisions, (a) the lot conforms, (b) the lot does not conform or (c) a second sample consisting of a specified number of individuals shall be taken from the lot and inspected. In the latter case, evidence from the combined sample is used to decide (a) the lot conforms, (b) the lot does not conform or (c) a third sample of a specified number of individuals be taken from the lot and inspected. The sampling proceeds in this manner until combined sample evidence leads to the decision that the lot conforms or that it does not conform.

The approach to inspection specifications must be realistic. To require that quality be confined within unnecessarily close tolerance limits or that quality be maintained at an unnecesarily high level is almost always uneconomical. To meet such requirements the producer is usually forced to use more costly materials, more expensive equipment, or more expensive processing such as special sorting operations than the consumer's needs justify. In the long run these costs must be passed on to the consumer. A factual study of consumer needs and producer ability should be part of specification preparation.

The producer must be able to meet the specification under conditions of reasonable process control if both parties to the contract are to be properly protected and business like dealings prevail. A specification might provide that a sample of 100 sheets, nominally 50.000 inch by 56.000 inches, be taken from each lot of book paper sheets and a lot be declared nonconforming if any sheet in the sample, when measured by specified procedure, departed from nominal by more than 0.001 inch at any point in either direction. It seems likely that no currently existing process is capable of sheeting a material such as paper to such tolerances. If this is so, a consumer who so specified would be able to purchase no paper or else have to waive that portion of the specification. It is generally true that waiving a provision by leaving it in the contract but with tacit understanding that it will not be enforced results in quality variation greater than would exist under a realistic clause. Furthermore, the consumer cannot express his risk quantitatively and the producer is not protected against a sudden decision to enforce the contract which could force him to accept the return of thousands of dollars worth of quite satisfactory product for resale or scrap.

The example used above may appear to be absurdly exaggerated but one can find numerous cases in so-called "specifications" that are comparable. One actual case is, "The tissue shall be free from holes, spots, dirt specks, wrinkles or other imperfctions." It seems needless to submit that no actual lot could ever conform to this clause. Presumably one speck found on one tissue could be grounds for declaring the lot, perhaps a carload, non-conforming. The producer may face considerable risk of trouble and expense because some busybody in the consumer's organization chooses to interpret the clause literally. The attributes, holes, spots, dirt specks, wrinkles, and imperfections, are not defined in the "specification." Suppose the consumer complains of dirt spects and the producer says that the specks are bark specks and that any one knows pulp of the sort used for that product must contain some bark specks which are not considered dirt in trade practices. Bad producer-consumer relations are almost certain to result. The fundamental objection is that such clauses are not operationally verifiable. That is, there is no objective procedure which can show rigorously that a lot does or does not conform.

A statement frequently found in "specifications" is, "material and workmanship must be of highest quality." The intent may be good but the results are a statement not operationally verifiable. Variation in quality from lot to lot and individual to individual is inescapable. Therefore, the use of the superlative requires that only one lot, and no one knows which one, can conform. Such statements are out of place in quality contracts. They can do no real good and they can do much harm.

An inspection specification may cover only one quality characteristic or it may cover several characteristics. If several characteristics are covered separately, the specification may provide that the lot be declared nonconforming if it is nonconforming with respect to any of the characteristics covered. It is possible, however, by proper weighting of characteristics to combine the sample evidence for all characteristics covered in index form and declare the lot conforming or nonconforming on the basis of the value of the index. The quality rating system devised by Dodge *(30)* suggests one type of system. It weights the quality defects on a demerit scale and the index "demerits per unit" could be used as a conformance criterion.

Essential Parts of the Inspection Specification

The essential parts of the inspection are: statement of product covered, statement of quality characteristics covered, definition of the lot, definition of the sample, testing and examination procedure, statistics to be calculated, conformance criteria, and disposition of the nonconforming lot. The part called "conformance criteria" is the specification and the part called "disposition of the nonconforming lot" is the action clause. The other parts, which are necessary to make these two parts un-

ambiguous, may be thought of as the "dimensions" of the specification. One serious weakness of many attempts at specification is that these "dimensions" are implied only.

Statement of Product Covered

The title or the first paragraph of the specification should state clearly the product or material with which it is concerned. There must be no ambiguity. If there is more than one grade of the product or material, the particular grade or grades involved must be made plain.

Statement of Quality Characteristics Covered

Early in the specification there must be a list of the quality characteristics covered by the agreement. Only those characteristics which can be covered in operationally verifiable inspection clauses should be included. Those characteristics which are not chosen for such coverage should be left on whatever faith and confidence basis existed before the preparation of the specification.

Definition of the Lot

The specification must state clearly just what quantity of goods constitutes the lot. The lot is both a sampling unit and an action unit. Proper choice of lot size depends on economic, technical and statistical considerations *(18)*. Generally it should be a quantity of goods submitted at one time. For the most rigorous and useful application of statistical methods, the lot should be essentially homogeneous in quality. This limits the lot size under most circumstances. If the lot size is made too small, an uneconomic amount of sampling and inspection may be required. Action on a nonconforming lot may be expensive and if so, one does not want the lot to be larger than necessary. The lot must be such that it can be sampled by practical systems. A unit from which sample individuals can be taken at only one point, for example a roll of paper, may not be a satisfactory lot. A carload of rolls, however, may be a very satisfactory lot. No rule of thumb can be given to cover all possible cases. Each case must be considered carefully on its own merits.

Definition of the Sample

The specification must state unambiguously and in detail the nature of the sample and the sampling operation.

If the lot must receive special treatment prior to or during sampling, it must be specified in detail. If the product changes in quality in time, the time of sampling must be specified. Conditions of cleanliness, humidity of atmosphere, light conditions, etc. which may be necessary before or during sampling must be stated.

The number of individuals or specimens which make up the sample must be definitely specified. The number depends chiefly on the type and degree of protection desired which, in turn, is related to technical and economic considerations. Often the business man is inclined to state the desired degree of protection at an unnecessarily high level and can be shown by careful analysis of conditions that a lower degree of protection or some other type of protection with reduced sample size is actually quite adequate. Sampling plans differ in sample size required for comparable protection. In general, the sequential and double sampling plans require smaller sample sizes than do single sampling plans. The sequential or double sampling plan may be uneconomical to administer in some cases because of fluctuating work load for inspectors or because the material handling system makes it difficult to secure the second, third, etc. samples when required. An A.O.Q.L. type of protection, in general, requires smaller sample sizes than a lot quality type of protection but the A.O.Q.L. plan does not fit in with all situations. Inspection by attributes nearly always requires larger sample sizes than inspection by variables. However, variables inspection may be so complex and time consuming and require such elaborate instruments and highly trained inspectors that the smaller sample size is no saving over attributes inspection. If action on nonconforming lots is sorting i.e. 100% inspection, the inspection of the sample is only part of the total inspection required by the plan. Dodge and Romig *(5)* plans for example, are arranged to require the minimum total inspection. Here, too, there is no general set of rules to cover all cases but careful study of economic, technical and statistical conditions is required in each case.

The exact procedure to be used in selecting the individuals or specimens to make up the sample must be specified carefully. Obviously, no useful specification system can operate on a sampling system which systematically selects only good or only bad individuals for the sample. The first consideration must be assurance that the quality of the individual has no bearing on whether or not it is included in the sample. This and other sources of bias can be reduced by using objectively random methods for sample selection which give the inspector no choice as to the individuals to be selected. For example the individuals in a lot may be assigned numbers. Numbers may then be drawn from a hat or a table of random numbers to decide which individuals are to be in the sample. There are many modifications of this method which give every individual in the lot an equal chance to be included in the sample. Systematic methods of selection such as, "take every tenth individual" are often satisfactory, particularly if the first individual's position in the sequence is decided by random selection. Even simple haphazard methods of sample selection may be satisfactory in some cases but they require great confidence in the unbiased judgment of the sampler.

There may be some necessary precautions regarding the treatment of the sample specimens prior to inspection. If so, they must be clearly specified. Paper or pulp specimens to be inspected for moisture must be taken by special procedure and protected against the influence of atmospheric moisture and handling prior to testing. If the product changes color on exposure to light, special precautions in sample treatment may be necessary if color characteristics are included in the inspection. Some precautions are properly specified under sampling and others under procedure for testing and inspecting.

Examination and Testing Procedure

The procedure for testing and examining the sample must be specified in detail. In some cases it is only necessary to refer to a standard method such as TAPPI, A.S.T.M., or standard text or reference work. Generally some modification of the standard method is necessary to make it fit the particular case and it seems best, in the interest of clarity, to include a complete writeup of the detailed procedure in the specification.

In the case of variables or measurements inspections, the number of tests or observations per specimen, the nature of the testing instrument, the procedure for using the instrument and the manner of recording the results must be specified. If special testing conditions are necessary, for example controlled temperature and humidity for some paper tests, they must be specified. Testing instruments have a habit of disagreeing with each other

Since the producer and consumer cannot afford to be in trolled by results of one instrument and the product inspected by a second instrument which disagrees with the first, it may be necessary to specify a calibration procedure to maintain the two instruments in agreement.

In the case of attributes inspection, the "holes, spots, dirt specks, wrinkles and other imperfections" must be clearly defined. What is a wrinkle and how it is observed? There must be no doubt on this point. Without rigorous definition of the attributes there can be no real "meeting of the minds" and no real agreement. Neither can there be consistency of inspection results because each inspector will have his own definition differing, at least slightly, with that of every other inspector and even from time to time for the same inspector. Good attributes definitions are not always easy to formulate. Some may be in words only; others may have to be by drawing or photograph or standard specimen for comparison. If it cannot be defined without ambiguity, it is doubtful that the attribute is of real importance and certainly it will be troublesome if included in an inspection specification. The manner of recording the results of attributes inspection should be specified.

Statistics to be Calculated

The manner in which the results of these tests and inspections are to be treated must be specified. For each attributes or variables inspection some sample statistic must be calculated for comparison with the conformance criteria. The details of the calculation, even to the number of significant figures to be carried *(4)*, must be set forth if there is any chance for misunderstanding.

In the case of attributes inspection the statistic may be number of defective individuals in the sample. fraction or percent of the sample items defective or the number of defects per sample or per unit of sample. These are simple counts or simple ratios. Fraction defective, for example, is the number of defective individuals in the sample divided by the total number of individuals in the sample.

The statistic may be more complex in the case of variables inspections. If the lot average basis weight, for example, is the characteristic specified, the sample statistic is likely to be the average (i.e. arithmetic mean) of the basis weight test values from the sample. It is simply specified as the sum of the test values divided by the number of tests. If the variability of basis weight within the lot, for example, is the characteristic specified, the statistic will be some measure of variability such as the sample range or the sample standard deviation. The range is the difference between the largest and the smallest test values obtained in testing the individuals of the sample. The standard deviation or root-mean square deviation of the test values about their average is described by simple formulas.

If the specification deals with a total quality index, the statistic demerits per unit might be used. In that case the demerit weighings and all calculations involved must be described in detail.

Conformance Criteria

This part of the specification sets forth clearly the values of the sample statistics which are agreed upon as evidence that the lot conforms to specification. It is usually the briefest section of the specification but the one requiring the most careful attention and the largest amount of effort in planning and preparation. In fact, this part is the specification. All other parts, though necessary, are incidental and serve only to make this part unambiguous. Modern statistical methodology applied to selecting and evaluating these criteria makes the difference between a practical, realistic contract and one of little or no utility.

The statements in this section are usually very simple. Some examples:

"The lot conforms to the specification when the sample contains 3.0% or less defective bundles." Here 3.0% is the conformance per cent defective or 0.030 is the conformance fraction defective.

"The lot conforms to the specification when the average of the twenty moisture test values is not less than 4.230% nor greater than 8.760%." Here 4.230% and 8.760% are conformance averages."

"The lot conforms to the specification when the standard deviation calculated from the fifteen basis weight tests values is not greater than 0.930 lb." Here 0.930 lb. is the conformance standard deviation.

From these conformance criteria, a knowledge of the within lot variability, a knowledge of the quality history of the production processes and some simple statistical devices, the specification may be evaluated quantitatively in terms of operating characteristics and the risks of consumer and producer. In fact, the preparation of the specification, when properly carried out, so arranges these conformance criteria that the desired operating characteristics, producer's and consumer's risks are attained.

Disposition of the Nonconforming Lot

The primary purpose of the inspection specification is to provide a basis for action on the lot of product. In general, the conforming lot will be accepted and used as intended. The agreement, however, should state clearly the nature of the action to be taken with regard to the nonconforming lot. That action may be rejection of the lot for return to the producer. Action of a wide variety of types may be agreed to, however. It may be possible to divert the nonconforming lot to some purpose other than the originally intended use and adjust the price accordingly. It may be possible to sort or otherwise adjust the nonconforming lot in the consumer's plant at the producer's expense. Discovery of a nonconforming lot may set in motion a special system of increased inspection in the plant of the producer, or the consumer or both which would operate until a sufficient flow of conforming lots warrants return to regular inspection procedure.

An Example Inspection Specification

The following strictly hypothetical inspection specification is submitted to illustrate the foregoing remarks and as a basis for the discussion of preparation and evaluation to follow. It is not implied that it is useful as a specification under conditions other than those assumed in the hypothetical case.

Inspection Specification
Book Paper Grade XXXX, 60 lb.

This specification is concerned with the average basis weight of a lot of Book Paper, Grade XXXX, 60 lb.

For purposes of this specification the lot shall be one carload of 100 rolls.

The sample shall consist of ten weigh sheets taken one from each of ten rolls as follows:

Before the car is opened the inspector shall draw one bead at random from a box of ten beads numbered consecutively from 1 to 10. The number on the bead drawn shall indicate, in unloading sequence, the first roll to be set aside for sampling. Starting with that roll, every tenth roll in the order unloaded shall be set aside for sampling until ten are set aside. For example, if the drawn bead bears the number 3, then the 3rd, 13th, 23rd, 33rd, 43rd, 53rd, 63rd, 73rd, 83rd, and 93rd rolls in order unloaded shall be set aside as sample rolls.

Each of the ten sample rolls shall be unwrapped, two rounds of paper removed from each and a sheet of paper the width of the roll and about 48 inches long taken from the third round of each roll. The ten sample sheets taken shall be conditioned for at least 4 hours in an atmosphere controlled according to TAPPI Standard 402-m. After conditioning and while still in the controlled atmosphere one 25 × 38 inches weigh sheet (the 38 inch in the machine direction) shall be taken from each of the ten sample sheets. The sheets shall be cut to size around the standard template using a knife sufficiently sharp to cut without tearing.

Each of the ten weigh sheets shall be weighed separately in the controlled atmosphere on the Model XX basis weight scale. The weight of each sheet

shall be recorded to the nearest 0.1 lb. basis weight on the 25 × 38 inch, 500 sheet folio.

Calculate the average of the ten test sheets by dividing the sum of the ten test values by ten.

The lot conforms to this specification if the average of the ten test values is not less than 56.45 pounds nor greater than 61.55 pounds. If the average of the ten test values is less than 56.45 pounds, the lot shall be reloaded into a car and returned to the producer who shall pay all transportation charges plus cost of unloading, loading and inspection.

If the average of the ten test values is greater than 61.55 pounds, the supplier shall allow a claim in amount calculated by the formula:

$$\text{dollars claim} = \left(1 - \frac{60.00}{\text{Obs. B.W. Av. lb.}}\right) \times \text{invoice weight of Lot in pounds} \times \text{price in dollars per pound delivered.}$$

Preparation and Evaluation of the Specification

The consumer knows from long experience with this grade of paper that he begins to encounter moderately serious running difficulties and increased waste because of low strength when average basis weight is about 56 pounds. Since he purchases paper by weight but sells it in his product by area, the consumer objects to basis weights much higher than the nominal 60 pounds. He knows that at 62 pounds the area per ton is about 3⅓% less than at 60 pounds. Loss of such an amount on a lot is objectional if it is sustained frequently.

The consumer is not insistent that the producer maintain a constant basis weight average but does want to be protected against large shifts in average. Thus, the grand lot plan is not indicated. An A.O.Q.L. plan requires that nonconforming lots be sorted and substandard material removed. There are practical difficulties involved in sorting this type of product which preclude adoption of an A.O.Q.L. plan. Lot quality type of protection appears to be quite suitable and is adopted as a basis for the specification. The values 56 and 62 pounds are selected as lot tolerance averages.

During a period of collection of preliminary information 200 carloads of paper are inspected by the plan later adopted in the specification. The within lot variability is estimated from the variability of the sample test values to be standard deviation = 1.12 pounds. Examination of the sample variability values reveals no pronounced evidence that the within car variability is not constant. The producer always makes that grade of paper on the same machine and in runs of even carloads so that paper within a car is not made at widely different times. These observations lead to a feeling of confidence in the homogeneity of within car variability and it is decided to accept the 1.12 pounds as the working estimate of within car standard deviation.

The consumer is willing to accept a 10% consumer's risk. That is, if lots come to him with true average basis weight of 56 or 62 pounds, he is willing that the sampling plan judge them conforming 10% of the time. The standard deviation of averages of samples of size ten is $1.12/\sqrt{10}$ or 0.354 pounds. Lots with true average 56 pounds can be expected to produce samples of ten tests which average greater than 56.45 pounds only 10% of the time. Lots with true average 62 pounds can be expected to produce samples of ten tests which average less than 61.55 pounds only 10% of the time.

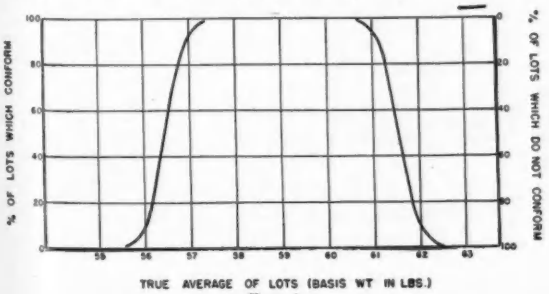


FIG. 1
Operating Characteristics

The simple statistical models leading to these conclusions seem quite well justified in this case and the values 56.45 and 61.55 pounds are adopted as conformance averages.

The operating characteristics of the specification can be examined in some detail. Figure 1 shows the operating characteristics curves which are prepared by plotting on the horizontal axis the true average basis weights of lots and on the vertical axis the fraction (percentage) of such lots which will, in the long run, be judged conforming (left hand scale) and nonconforming (right hand scale) by sample evidence according to the terms of the specification. An examination of these curves reveals a great deal of valuable information enabling producer and consumer to evaluate the specification. For example:

1. In the long run, lots submitted with true average 56 or 62 pounds (the lot tolerance averages) will be judged conforming 10% of the time. This is the consumer's risk desired.

2. Lots submitted at true average between 57.5 and 60.5 pounds will practically always be judged conforming. If the producer maintains his true lot average in this range, he runs practically no risk of having lots judged nonconforming.

3. As the true lot average becomes less than 57.5 pounds and greater than 60.5 pounds, the producer runs increasingly greater risk of having lots judged nonconforming on sample evidence. At 56.45 and 61.55 pounds about 50% of lots will yield nonconforming sample evidence; at 56 and 62 pounds the producer's risk is 90%; above 62.5 pounds and below 55.5 pounds practically no lots will be found to conform on sample evidence i.e. the producer's risk is practically 100%.

NUMBER OF CARS	SAMPLE AVERAGE
0	57.45 — 57.94
2	57.95 — 58.44
8	58.45 — 58.94
19	58.95 — 59.44
25	59.45 — 60.05
50	60.06 — 60.55
65	60.56 — 61.05
21	61.06 — 61.55
9	61.56 — 62.05
1	62.06 — 62.55

TABLE I.—SAMPLE AVERAGE BASIS WEIGHTS OBSERVED IN 200 CARLOADS

Another interesting observation is the distribution of

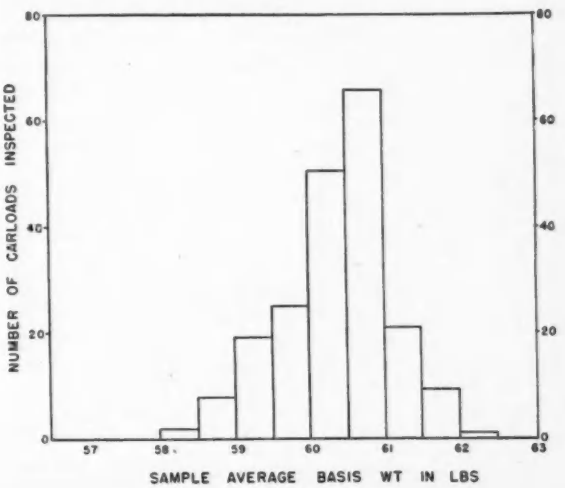


FIG. 2

sample averages noted during the preliminary period of date collection. This distribution is shown in Table I and in Fig. 2. Of the 200 carloads sampled, ten were found nonconforming because the sample average was greater than 61.55 pounds. None were found conforming because of sample averages less than 56.45 pounds. It would seem reasonable to conclude that the producer can expect about 5% of his lots to be declared nonconforming if he continues to operate his production process in the future exactly as he has in the past. The producer notes, however, that the grand average for samples for all 200 carloads is well above the nominal 60-pound basis weight and agrees that improved process control will result in fewer high basis weight lots. The specification effort has served the consumer by bringing pressure to bear on this point.

Further consideration as to the possibility of a more economical sampling plan might be in order. However, both producer and consumer have psychological objections to a sample size less than 10. A double or sequential sampling system is somewhat difficult in this case. In any case no large saving can be made by reducing the sample size below ten. Since the sensitivity of the plan with sample size ten is satisfactory to both parties, there is no reason to study the characteristics resulting from larger samples.

The producer and consumer agree after a series of discussions to adopt the inspection specification as written and use it as a basis for doing business with each other for a trial period of six months. At the end of that time the agreement is to be reviewed and any necessary adjustments discussed.

Conclusions

It is not possible in an article such as this to demonstrate conclusively that inspection specifications provide the answer to the problem of the quality contract. Proof can be obtained by trial. Such contracts are operating successfully to the mutual benefit of consumer and producer and result in a degree of harmony not previously enjoyed. The writer has heard of no case where an enlighted and sincere effort to arrive at such a contract has failed. The writer knows of no individual who, after a careful study of the technical, economic and statistical aspects of the subject, is not convinced that here is a valuable tool long sought by business men.

Literature Cited

The following list of 31 references is by no means a complete bibliography of this subject. Omission of a reference from this list does not necessarily imply that the reference is unimportant. A study of the material in these references will provide the important specification concepts and methods and lead, through bibliographies in the references to articles on any specialized phase of the subject in which the reader is interested.

1. Ashkinazy, S. B., Material Purchase Specifications, ASTM Bulletin, December 1946, p. 48-51.
2. Dodge, H. F., Discussion on Statistical Quality Control and Its Relation to Specifications, ASTM Bulletin, March 1946.
3. Dodge, H. F., Acceptance—Rejection Requirements in Specifications, Proc. ASTM 34, Part II, p. 877-890 (1934).
4. Dodge, H. F., Significance of Numerical Limits in Specifications, ASTM Bulletin, May 1947, p. 13.
5. Dodge, H. F., and Romig, H. G., "Sampling Inspection Tables," John Wiley & Sons, Inc., N. Y. (1944).
5. Dudding, B. P., and Jennett, W. J., Quality Control, Use of Statistical Methods in the Metallurgical Industry, *Metal Industry* (Brit.), March 2, 1945, p. 130-133; *Metal Industry* (Brit.), March 9, 1945, p 146-149.
7. Darwin, Sir Charles, The Effect of Tolerances on Measurements, *Metal Progress*, May 1945, p. 941-946.
8. Feely, F. J., Quality Control in Manufacture, *Mech. Eng.*, October 1945.
9. Freeman, H. A., "Industrial Statistics," Chapter V, John Wiley & Sons, Inc., N. Y. (1942).
10. Statistical Research Group, Columbia University, "Sequential Analysis of Statistical Data: Applications," Columbia University Press (1945).
11. Statistical Research Group, Columbia University, "Selected Techniques of Statistical Analysis," McGraw-Hill Book Co., N. Y. (1947).
12. Grant, E. L., "Statistical Quality Control," McGraw-Hill Book Co., N. Y. (1946).
13. Goffman & Manuele, Use of Statistics in Writing Specifications, ASTM Bulletin, March 1946, p. 13-17.
14. Juran, J. M., "Management of Inspection and Quality Control," Harper and Brothers (1945).
15. Peach, Paul, "Industrial Statistics and Quality Control," Edwards & Broughton Co., Raleigh, N. C. (1947).
16. Reinsmith, G., Preparation and Use of Specifications, ASTM Bulletin, March 1946, p. 41-44.
17. Romig, H. G., "Allowable Average in Sampling Inspection," Ph.D. Thesis, Columbia University, 1939.
18. Simon, L .E., "The Industrial Lot and Its Sampling Implications," J. Franklin Inst., May 1944.
19. Simon, L. E., Dollars for Your Thoughts, ASTM Bulletin, March 1946, p. 17-21.
20. Simon, L. E., "An Engineer's Manual of Statistical Methods," John Wiley & Sons, Inc., N. Y. (1941).
21. Sturtevant, J. V., Statistical Quality Control, *Metals and Alloys*, January 1945, p. 138.
22. Steadman, F. M., The Preparation of Specifications, *Am. Dyestuff Reporter* 33, 491-495 (Nov. 20, 1944).
23. Shewhart, W. A., Some Aspects of Quality Control, *Mech. Eng.*, December 1934.
24. Shewhart, W. A., "Economic Control of Quality of Manufactured Product," D. Van Nostrand Co., Inc., N. Y. (1931).
25. Shewhart, W. A., "Statistical Method from the Viewpoint of Quality Control," The Graduate School, U. S. Dept. of Agriculture (1940).
26. Wainwright, C., Statistical Quality Control—Elementary Principles in Preparation of Specifications, *British Plastics* 18, 524-530 (December 1946).
27. Wiley, N. C., "Statistical Methods as An Aid in Revising Specifications," Proc. ASTM, 38, Part 2, 647-654 (1938).
28. Westman, A. E. R., "Introduction to Statistics," ASTM Bulletin No. 148, p. 61-63 (October 1947).
29. Westman, A. E. R., "An Extension Course in Statistical Quality Control," Reprinted from "Manufacturing and Industrial Engineering," Consolidated Press, Ltd., Toronto.
30. Dodge, H. F., A Method of Rating Manufactured Product," *Bell System Technical J* 7, 350-368 (1928).
31. Wolterding, R. A., and Catlin, J. B., Specification Buying of Packaging Materials, *Modern Packaging* 18, No. 9, p. 136-9 (May 1945).

Organic Reagents

Interscience Publishers has just issued "Organic Reagents" by John F. Flagg of the Research Laboratory, General Electric Company (300 pp. 6x9). The objective of this book is to describe the various organic reagents (precipitants) used in gravimetric and volumetric analysis, and to indicate the type of analytical procedure in which they may be used to advantage. This is the fourth in a series of monographs on analytical chemistry and its applications.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $6.00 per copy.

Principles of Food Freezing

John Wiley & Sons, Inc., have just issued "Principles of Food Freezing" by Gortner, Erdman, and Masterman of the School of Nutrition, Cornell University. (281 pp. 5½ x 8½).

The authors have collected in this volume some of the basic principles governing the various steps of selecting and processing foods for freezing, and of storing them in the frozen state.

Although most of the book deals largely with the food freezing operations, it is of interest to the paper industry because of the various packaging and storing problems involved.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $3.75 per copy.

Telemetering

Reinhold Publishing Company recently issued "Principles and Methods of Telemetering" by Perry A. Borden and Gustave M. Thynell of the Bristol Company. (230 pp. 6x9).

This book deals with various methods of remote control measurement, a practice that is finding increasing application in the pulp and paper industry.

Among the subjects covered are: current, voltage and frequency systems of telemetering; impulse systems; interconnecting circuits and channels; coordinating, totalizing, computing, and integrating; remote reading of dials and registers; selection and application of telemetering systems; list of patents.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $4.50 per copy.

ENGINEERING
LIBRARY

DEC 20 1948

Paper TRADE JOURNAL

VOLUME 127, NO. 25 DECEMBER 16, 1948

WOOD PULP

G

Established 1886

"The year is all but done."
CHARLES KINGSLEY

Sixty-three year-ends have passed in the course of our close and happy association with Pulp and Paper.

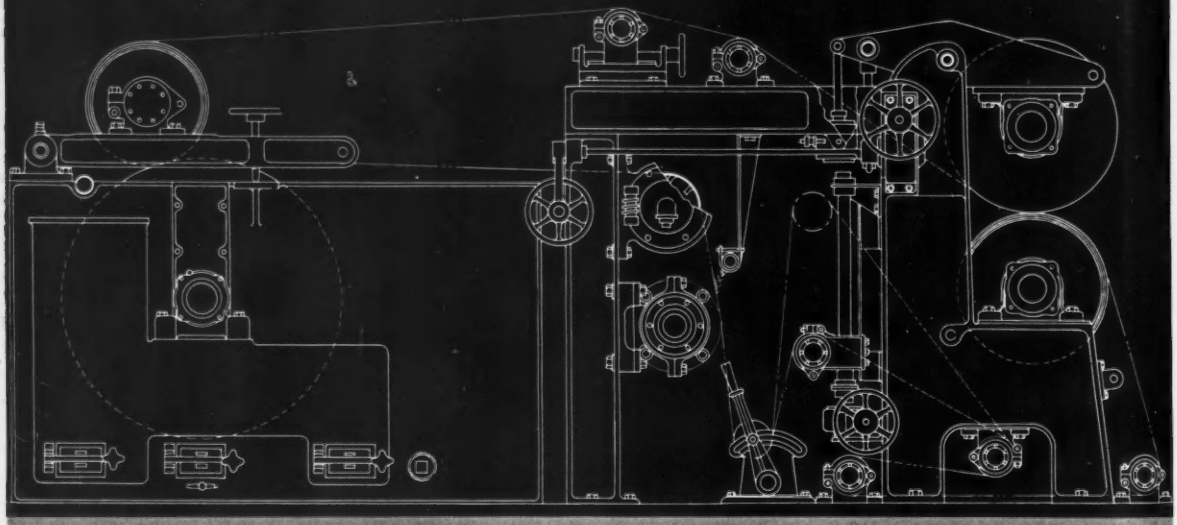
With full faith and through the ebb and flow of these years we have never wavered in our confidence in the ability and manifest destiny of American papermaking.

It is our desire and intention to remain geared in organization and facilities to the increasing needs of an ever-growing industry.

GOTTESMAN & COMPANY
— INCORPORATED —
22 EAST 40th STREET • NEW YORK 16, N. Y.
EUROPEAN OFFICES: Birger Jarlsgatan 8, Stockholm, Sweden

Modern Wet Machine

BUILT TO PAPER MACHINE QUALITY SPECIFICATIONS



This Downingtown Wet Machine is designed and built for low maintenance. It will pay for itself and return substantial dividends on the investment. Everything in its make-up is "the best". . . . Ends are of cast iron and the body is 3-inch Low Land Cypress. Whipper is balanced, all metal with four bats. Felt is continuously maintained in proper condition by a Downingtown Suction Felt Roll. The machine can be equipped with Pneumatic Loading and Lifting Equipment, if desired. . . . Naturally, this DeLuxe Downingtown Wet Machine costs a little more than the "ordinary," but we believe you'll agree that it's worth a lot more.

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

Write us for prints, specifications and a quotation. Deliveries are good.

DOWNINGTOWN

Designers & Builders
Paper Making Machinery

PUBLISHED

EVERY THURSDAY

by

LOCKWOOD TRADE JOURNAL CO.

15 West Forty-Seventh Street
New York 19, New York
Telephone: Plaza 7-2370

•

GEORGE E. LOCKWOOD
President and Treasurer
ARTHUR E. GORDON
Vice-President
JOSEPH P. HORGAN
Secretary
H. G. HEITZEBERG
Editor
E. P. McGINN
Industrial Editor
E. P. NUTTALL
Assistant Editor
R. G. MACDONALD
"TAPPI" Editor
F. B. GROSSE
Production Manager

•

REPRESENTATIVES:

Eastern

BRUCE E. BROWN
EDWARD H. DOERING
15 West Forty-Seventh Street
New York 19, N. Y.
Phone: PLaza 7-2370

Mid-Western

H. K. VINTON
30 North Dearborn Street
Chicago 2, Ill.
Phone CEntral 6-2784

FRANKLYN H. OLSEN
4892 Oakland Drive, Lyndhurst
Cleveland 24, Ohio
Phone: EVergreen 5198

Pacific Coast

ROY M. McDONALD & CO.
564 Market Street
San Francisco 4, Calif.
Phone: YUkon 6-0503

639 South Wilton Place
Los Angeles 5, Calif.
Phone: Drexel 2590

Terminal Sales Building
Seattle 1, Wash.
Phone: Main 3860

Southern

EDWARD M. BUCK
1000 Main Street
Dallas, Texas
Phone: Riverside 5625

Scandinavian

Oxford Trading Aktiebolaget
Bibliotekgatan 6-8
Stockholm, Sweden

•

Subscriptions:

Payable in advance.
By the year, $5.00
Single copy 15 cents.
Canada, $7.00
Other Foreign countries, $8.50

MEMBER

DEC. 16, 1948 In This Issue

	Page
Rail Shipment Requirements Change Dec. 30	13
Olmsted Gives Capehart Committee Industry Facts	14
Building Watson Island Cellulose Plant	14
Credit Executives Appraise 1949	14
Philadelphians Elect Officers—Play Santa to Children	15
Bids Opened on GPO First-Quarter, 1949 Paper Needs	16
The Mechanical Seal	21
Chemical Cleaning of Heat Exchange Equipment	26
Specialty Papers Manufactured by Pacific Mills Limited at Ocean Falls and Vancouver, B. C.	31
Sandy Hill-Canadian Vickers Deal	38
United States Imports and Exports	46
India's Paper, Present and Projected	48
Pulp and Paper Manufactures in the U. S., October 1948	50
How Users Appraise the Paper Markets	54
Pulp, Paper, and Board Production, 1947	72
A Study of Penetration of Starch Adhesive in a Coating Mixture Into Base Paper	83

DEPARTMENTS

	Page		Page
Industrial Development	21	Financial Record	44
Trends	37	Letters	76
Imports	38	Production Ratio Report	78
Prices	40	Obituary	80
Markets	42	TAPPI Section	83
		Classified Advertising	92

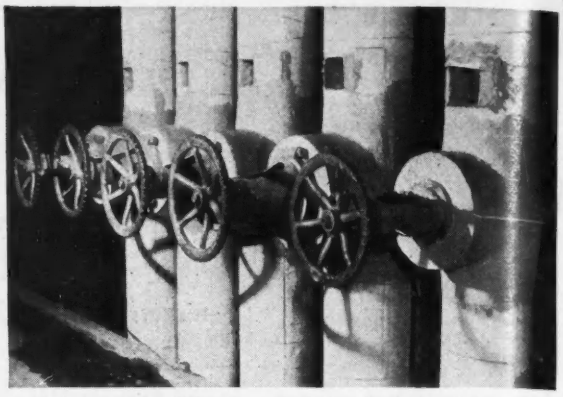
INDEX TO ADVERTISEMENTS ON PAGE 108

Paper TRADE JOURNAL

VOL. 127 **NO. 25**

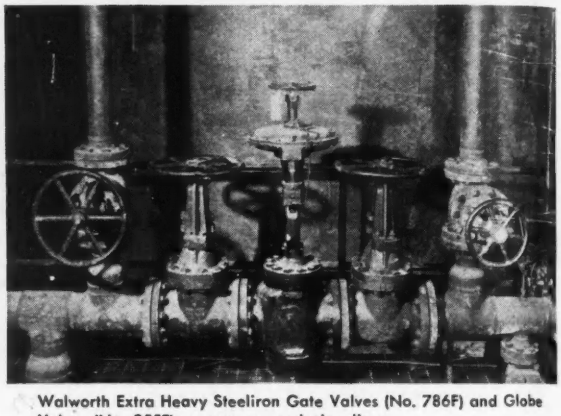
Entered as Second Class matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 N. Crystal St., East Stroudsburg, Pa. Printed in U.S.A. Copyright 1948 by Lockwood Trade Journal Co., Inc. PAPER established Feb. 17, 1899, combined with PAPER TRADE JOURNAL, Nov. 16, 1899. PAPER, established Sept. 21, 1910, combined with PAPER TRADE JOURNAL, February 19, 1926. All rights to the above titles reserved. Contents of PAPER TRADE JOURNAL, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission. PAPER TRADE JOURNAL is indexed in *Industrial Arts Index* and *Engineering Index*. Also publisher of LOCKWOOD'S Annual DIRECTORY OF THE PAPER AND ALLIED TRADES.

Walworth Iron Body Bronze Mounted Gate Valves (No. 726F) on steam line to paper machine.

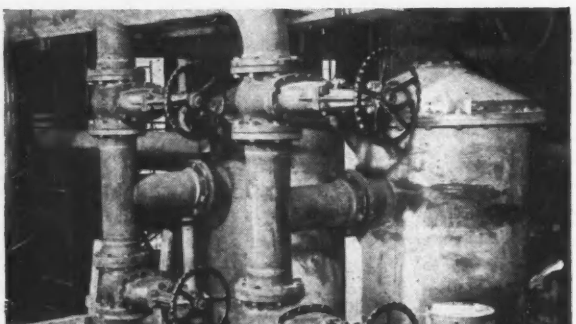


Walworth Series 900 Pressure-Seal Cast Steel Gate Valves with welding ends on main steam lines.

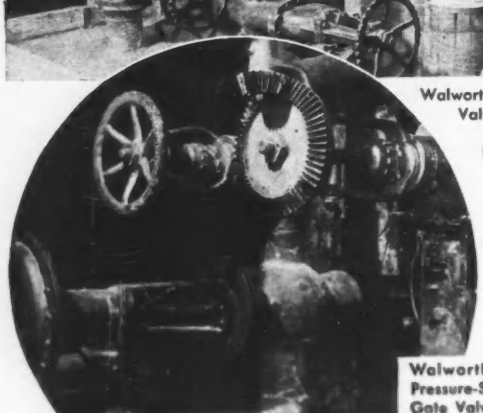
Walworth Special Alloy Pulp Mill Gate Valves (No. 725FS) and Check Valves (No. 928FS) on liquor lines.



Walworth Extra Heavy Steeliron Gate Valves (No. 786F) and Globe Valves (No. 955F) on pressure reducing lines.



Walworth All Iron Gate Valves (No. 727F) in weak black liquor service.



Walworth Series 900 Pressure-Seal Cast Steel Gate Valves with welding ends on feed water lines to boiler.

Valves for Pulp and Paper Mill Service

Valves play an important part in the efficient operation of any pulp or paper mill. For new construction, or for maintenance, pulp and paper mill engineers are choosing the right valve for each specific service from Walworth's complete line.

Walworth manufactures valves and pipe fittings of steel, steeliron, iron, bronze, and special alloys. Illustrated are Walworth valves of latest design, installed in a variety of services in a modern pulp and paper mill.

For further information and details of Walworth's complete line of valves and fittings, see your local Walworth distributor, or write for Catalog 47.

WALWORTH

Pulp and Paper Mill Division

60 EAST 42nd ST., NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Paper TRADE JOURNAL
Reg. U.S. Pat. Off.

Dec. 16, 1948

VOL. 127, NO. 25

Rail Shipment Requirements Change Dec. 30

By EDWIN CHESTER HASTINGS
Edwin Chester Hastings Traffic Service, Pittsburgh, Pa.

The notation shippers of ground wood paper are required to place on bills-of-lading and shipping orders will be radically changed, effective December 31, 1948. On and after that date the notation must read as follows: *"Ground Wood Paper, other than napkin paper, newsprint, paper toweling, toilet paper, and unfinished blank wall paper, not coated, fiber content consisting of not less than 60 percent ground wood."* Failure to comply will bring higher freight charges. The requirement applies to rail shipments, carloads, with the point of origin in New York, Pennsylvania, New Jersey, Delaware, West Virginia and the upper part of Virginia north of Roanoke and Norfolk. Other states will follow and to save money, the shipper to be safe should put the above notation on the documents.

The term *ground wood papers* includes such paper as catalog, directory, drawing, manila, novel, poster, printing, tablet or writing, and does not include paper which has been further processed after its original manufacture. The rolls must be not less than 16 inches in diameter; or if in sheets, not less than 336 square inches in packages.

The low rate by rail on box material of Class 27½J (27½ percent of the first class rate) limited to fiberboard or pulpboard, with wooden cleats, shipped knocked-down, panels, applicable in the East and South, has been broadened to allow the flat sheets to be scored and slotted, with or without paper lining, printed or not printed, on carloads of 36,000 pounds minimum, the same rating, *but only applies in the East.*

Many containers are of such strength that they can be used for reshipments. Also, the purchaser sometimes repaints the product as a trade-mark to distinguish his peculiar brand and as a method of advertising. It is a requirement of Rule 41 in the Rail Classification for the "Certificate Of Maker" to be impressed on each carton. The

Certificate of Maker

This is a (type of container) made of fibreboard and conforms to all construction requirements of Consolidated Freight Classification.

Sidewall Test ..... lbs. per sq. in.

Net Weight Limit ..... Pounds

******(maker's name and address)******

Certificate of Shipper

This ..... bears manufacturers' certificate required by Rule 41 of Consolidated Freight Classification which has peen painted over.

******(shipper's name and address)******

standard form is 2″ x 3¼″ in size and is worded as shown in the accompanying illustration:

When paper articles are shipped in cartons, it is also a requirement to insert on the bill-of-lading and shipping order that the container meets all the requirements. If that certificate on the carton is obscured in some way so that it can't be seen, the freight charges are increased on carloads ten percent and on less-than-carloads 20 percent. These increased charges also apply if the container does not meet the required specifications.

After December 30, 1948, the *Certificate of Maker* can be painted over and there will not be a penalty, provided a *Certificate of Shipper* is placed on the painted surface. (The "information" may be stenciled near the original impression.) If this "Certificate of Maker" required by the Classification is painted over, the following information must replace it in size 1¼″ x 3¼″, as shown in the accompanying illustration:

(Continued on page 34)

Rayon Pulp Mill Planned for Natchez

NATCHEZ, Miss. — The International Paper Co. is ready to build a $20,000,000 rayon pulp mill here if a bond issue for $300,000 to provide for purchase of the site is approved by the people of this city on either January 11 or 18. The mill will have an annual payroll of $2,500,000 when in full operation.

Major Jack Friend, vice-president of the Southern Kraft Division of the International Paper Co., speaking before the Association of Commerce here on December 14, said that the proposed mill would consume about 270,000 cords of pulpwood annually. It will have an output of 300 tons of rayon pulp daily and will be the first in the world to use hardwoods instead of softwoods in the commercial production of dissolving pulps. The new process is based on the sulphate or kraft process instead of on the sulphite process used traditionally for making such pulps. From the viewpoint of the growing rayon industry in North America, this development means that dissolving woodpulp production will be sufficient to meet the increased demands from new rayon yarn capacity, existing and authorized.

Chairman Office Dropped

NEW YORK — *Following the meeting of directors on December 14, John H. Hinman, president of the International Paper Co., disclosed that the office of chairman of the corporation had been discontinued.*

This office has been vacant since the death of R. J. Cullen on November 13. It was created in 1943 when Mr. Hinman succeeded Mr. Cullen as president and Mr. Cullen became chairman.